



#12

SEQUENCE LISTING

<110> Zur Megede, Jan
Barnett, Susan W.
Egnelbrecht, Susan
van Rensburg, Estrelita Janse

<120> POLYNUCLEOTIDES ENCODING ANTIGENIC HIV TYPE C
POLYPEPTIDES, POLYPEPTIDES AND USES THEREOF

<130> PP01631.102 (CHIR-1631/03US)

<140> 09/899,575

<141> 2001-07-05

<150> 09/610,313

<151> 2000-07-05

<160> 143

<170> PatentIn Ver. 2.0

<210> 1

<211> 60

<212> DNA

<213> Human immunodeficiency virus

<400> 1

gacatcaagc agggccccaa ggagcccttc cgcgactacg tggaccgctt cttcaagacc 60

<210> 2

<211> 60

<212> DNA

<213> Human immunodeficiency virus

<400> 2

gacatccgcc agggccccaa ggagcccttc cgcgactacg tggaccgctt cttcaagacc 60

<210> 3

<211> 1479

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic Gag
of HIV strain AF110965

<400> 3

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ctggagaagt tgcacctgaa ccccggcctg ctggagacca gcgagggctg caagcagatc 180
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gtgcaccagg ccatcagccc ccgcaccctg aacgcctggg tgaaggtgat cgaggagaag 480
gccttcagcc ccgaggtgat ccccatgttc accgcctga gcgagggcgc cccccccag 540

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gacctgaaca cgatgttgaa caccgtgggc ggcaccagg ccgccatgca gatgctgaag 600
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ctgcaggagc agatcgcttg gatgaccagc aaccccccca tccccgtggg cgacatctac 780
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cccggaact tcctgcagag ccgccccgag ccaccgccc ccccgccga gagcttccgc 1380
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<210> 4

<211> 1509

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic Gag
of HIV strain AF110967

<400> 4

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ctggagggct tcgccttgaa ccccgccctg ctggagaccg ccgagggtg caagcagatc 180
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cccgccgaga gcttcgcgtt cgaggagacc acccccggc ccaagcagga gccaaggac 1440
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agccagtaa 1509

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<210> 5

<211> 141

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Env common region of HIV strain AF110968

<400> 5

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gccatgtacg ccccccccat cgccggcaac ctgacctgcg agagcaacat caccggcctg 120
ctgctgaccc gcgacggcgg c 141
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<210> 6

<211> 1431

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic gp120 coding region of HIV strain AF110968

<400> 6

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aagaccaccc tgttctgcac cagcgacgcc aaggcctacg agaccgaggt gcacaacgtg 120
tgggccaccc acgcctgcgt gcccaccgac cccaaccccc aggagatcgt gctggagaac 180
gtgaccgaga acttcaacat gtggaagaac gacatggtgg accagatgca cgaggacatc 240
atcagcctgt gggaccagag cctgaagccc tgcgtgaagc tgacccccct gtgctgaccc 300
ctgaagtgcc gcaacgtgaa cgccaccaac aacatcaaca gcatgatcga caacagcaac 360
aaggggcgaga tgaagaactg cagcttcaac gtgaccaccg agctgcgcga ccgcaagcag 420
gaggtgcacg ccctgttcta ccgcctggac gtggtgcccc tgcaggggcaa caacagcaac 480
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aaccagacct tcaacggcac cggcccctgc aacaacgtga gcagcgtgca gtgcgcccac 660
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atgcgcgaca actggcgcaa cgagctgtac aagtacaagg tggaggagat caagcccctg 1380
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<210> 7

<211> 1944

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic gp140 coding region of HIV strain AF110968

<400> 7

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gtgaccgaga acttcaacat gtggaagaac gacatggtgg accagatgca cgaggacatc 240
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gaggtgcacg ccctgttcta ccgcctggac gtggtgcccc tgcagggcaa caacagcaac 480
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aagaacgaga aggacctgct ggccctggac agctggcaga acctgtggaa ctggttcage 1920
atcaccaact ggctgtggtg catc 1944

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<210> 8

<211> 2466

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
gp160 coding region of HIV strain AF110968

<400> 8

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aagaccaccc tgttctgcac cagcgacgcc aaggcctacg agaccgaggt gcacaacgtg 120
tgggccaccc acgcctgcgt gcccaccgac cccaaccccc aggagatcgt gctggagaac 180
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atcatcatcc gcagcgagaa cctggccaac aacgccaaga tcatcatcgt gcagctgaac 780
aagcccgtga agatcgtgtg cgtgcgcccc aacaacaaca cccgcaagag cgtgcgcac 840

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ctggacacca tcgccatcg cgtggccgag ggcaccgacc gcatcatcga gttcatccag 2400
cgcatctgcc gcgccatccg caacatcccc cgccgcatcc gccagggctt cgaggccgcc 2460
ctgcag 2466

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<210> 9

<211> 2547

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
signal sequence and gp160 coding region of HIV
strain AF110968

<400> 9

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aagaagagcg	ccatcagcct	gctggacacc	atcgccatcg	ccgtggccga	gggcaccgac	2460
cgcacatcg	agttcatcca	gcgcacatgc	cgcgccatcc	gcaacatccc	ccgccgcac	2520
cgcagggct	tcgaggccgc	cctgcag				2547

<210> 10

<211> 1035

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic a
gp41 coding region of HIV strain AF110968

<400> 10

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cagaacaacc	tgctgcgcgc	catcgaggcc	cagcagcacc	tgctgcagct	gaccgtgtgg	180
ggcatcaagc	agctgcagac	ccgcacctct	gccgtggagc	gctacctgaa	ggaccagcag	240
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gaccgcgaga	tcaacaacta	caccgacacc	atctaccgcc	tgctggagga	gagccagaac	420
cagcaggaga	agaacgagaa	ggacctgctg	gccctggaca	gctggcagaa	cctgtggaac	480
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cgcacgaggg	aggaggcgga	cgagcaggac	cgcggcgcga	gcacccgcct	ggtgagcggc	720
ttcctggccc	tgccctggga	cgacctgcgc	agcctgtgcc	tggttcageta	ccaccgcctg	780
cgcgacttca	tcctgatcgc	cgcccgcgtg	ctggagctgc	tgggccagcg	cggtggggag	840
gccctgaagt	acctgggcag	cctggtgcag	tactggggcc	tggagctgaa	gaagagcgcc	900
atcagcctgc	tggacaccat	cgccatcgcc	gtggccgagg	gcaccgaccg	catcatcgag	960
ttcatccagc	gcacatgcgg	cgccatccgc	aacatcccc	gccgcacccg	ccagggcttc	1020
gaggccgccc	tgag					1035

<210> 11

<211> 144
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic Env
 common region of HIV strain AF110975

<400> 11

agcatcatca ccctgccctg ccgcatcaag cagatcatcg acatgtggca gaaggtgggc 60
 cgcgccatct acgccccccc catcgagggc aacatcacct gcagcagcag catcaccggc 120
 ctgctgctgg cccgcgacgg cggc 144

<210> 12

<211> 1437

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
 gp120 coding region of HIV strain AF110975

<400> 12

agcggcctgg gcaacctgtg ggtgaccgtg tacgacggcg tgcccgtgtg gcgcgaggcc 60
 agcaccaccc tggtctgcgc cagcgacgcc aaggcctacg agaaggaggt gcacaacgtg 120
 tgggccaccc acgcctgcgt gccaccgcac cccaaccccc aggagatcga gctggacaac 180
 gtgaccgaga acttcaacat gtggaagaac gacatgggtg accagatgca cgaggacatc 240
 atcagcctgt gggaccagag cctgaagccc cgcgtgaagc tgacccccct gtgctgacc 300
 ctgaagtga ccaactacag caccaactac agcaacacca tgaacgccac cagctacaac 360
 aacaacacca ccgaggagat caagaactgc accttcaaca tgaccaccga gctgcgcgac 420
 aagaagcagc aggtgtacgc cctgttctac aagctggaca tcgtgcccct gaacagcaac 480
 agcagcgagt accgcctgat caactgcaac accagcgcca tcaaccaggc ctgccccaaag 540
 gtgagcttcg accccatccc catccactac tgcgcccccg ccggctacgc catcctgaag 600
 tgcaagaaca acaccagcaa cggcaccggc ccttgccaga acgtgagcac cgtgcagtgc 660
 acccacggca tcaagcccgt ggtgagcacc cccctgctgc tgaacggcag cctggccgag 720
 ggcggcgaga tcatcatccg cagcaagaac ctgagcaaca acgcctacac catcatcgtg 780
 cacctgaacg acagcgtgga gatcgtgtgc acccgcccca acaacaacac ccgcaagggc 840
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 caggcccaact gcaacatcag cgccggcgag tggaacaagg ccgtgcagcg cgtgagcgcc 960
 aagctgcgcg agcacttccc caacaagacc atcgagttcc agcccagcag cggcggcgac 1020
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 gccatctacg cccccccat cgagggaac atcacctgca gcagcagcat caccggcctg 1260
 ctgctggccc gcgacggcgg cctggacaac atcaccaccg agatcttccg cccccagggc 1320
 ggcgacatga aggacaactg gcgcaacgag ctgtacaagt acaaggtggt ggagatcaag 1380
 cccctgggcg tggccccac cgaggccaag cgccgcgtgg tggagcgaga gaagcgc 1437

<210> 13

<211> 1950

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
 gp140 coding region of HIV strain AF110975

<400> 13

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agcggcctgg gcaacctgtg ggtgaccgtg tacgacggcg tgcccgtgtg gcgcgaggcc 60
agcaccaccc tgttctgcgc cagcgacgcc aaggcctacg agaaggaggt gcacaacgtg 120
tgggccaccc acgcctgcgt gccaccgac cccaaccccc aggagatcga gctggacaac 180
gtgaccgaga acttcaacat gtggaagaac gacatggtgg accagatgca cgaggacatc 240
atcagcctgt gggaccagag cctgaagccc cgcgtgaagc tgacccccct gtgcgtgacc 300
ctgaagtgca ccaactacag caccaactac agcaacacca tgaacgccac cagctacaac 360
aacaacacca ccgaggagat caagaactgc accttcaaca tgaccaccga gctgcgcgac 420
aagaagcagc aggtgtacgc cctgttctac aagctggaca tcgtgccctt gaacagcaac 480
agcagcgagt accgcctgat caactgcaac accagcgcca tcaccaggc ctgccccaaag 540
gtgagcttcg accccatccc catccactac tgcgcccccg ccggctacgc catcctgaag 600
tgcaagaaca acaccagcaa cggcaccggc ccctgccaga acgtgagcac cgtgcagtgc 660
acccacggca tcaagcccgt ggtgagcacc cccctgctgc tgaacggcag cctggccgag 720
ggcggcgaga tcatcatccg cagcaagaac ctgagcaaca acgcctacac catcatcgtg 780
cacctgaacg acagcgtgga gatcgtgtgc acccgcccca acaacaacac ccgcaagggc 840
atccgcatcg gccccggcca gaccttctac gccaccgaga acatcatcgg cgacatccgc 900
caggcccaact gcaacatcag cgccggcgag tggaaacaagg ccgtgcagcg cgtgagcgcc 960
aagctgcgcg agcacttccc caacaagacc atcagattcc agcccagcag cggcggcgac 1020
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gccagcatca ccctgaccgc ccaggcccg cagctgctga gcggcatcgt gcagcagcag 1560
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aaggagatca gcaactacac cggcatcatc taccgcctgc tggaggagag ccagaaccag 1860
caggagcaga acgagaagga cctgctggcc ctggacagcc gcaacaacct gtggagctgg 1920
ttcaacatca gcaactggct gtggtacatc 1950
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<210> 14

<211> 2493

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
gp160 coding region of HIV strain AF110975

<400> 14

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agcggcctgg gcaacctgtg ggtgaccgtg tacgacggcg tgcccgtgtg gcgcgaggcc 60
agcaccaccc tgttctgcgc cagcgacgcc aaggcctacg agaaggaggt gcacaacgtg 120
tgggccaccc acgcctgcgt gccaccgac cccaaccccc aggagatcga gctggacaac 180
gtgaccgaga acttcaacat gtggaagaac gacatggtgg accagatgca cgaggacatc 240
atcagcctgt gggaccagag cctgaagccc cgcgtgaagc tgacccccct gtgcgtgacc 300
ctgaagtgca ccaactacag caccaactac agcaacacca tgaacgccac cagctacaac 360
aacaacacca ccgaggagat caagaactgc accttcaaca tgaccaccga gctgcgcgac 420
aagaagcagc aggtgtacgc cctgttctac aagctggaca tcgtgccctt gaacagcaac 480
agcagcgagt accgcctgat caactgcaac accagcgcca tcaccaggc ctgccccaaag 540
gtgagcttcg accccatccc catccactac tgcgcccccg ccggctacgc catcctgaag 600
tgcaagaaca acaccagcaa cggcaccggc ccctgccaga acgtgagcac cgtgcagtgc 660
acccacggca tcaagcccgt ggtgagcacc cccctgctgc tgaacggcag cctggccgag 720
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ggcggcgaga	tcatcatccg	cagcaagaac	ctgagcaaca	acgcctacac	catcatcgtg	780
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caggcccaact	gcaacatcag	cgccggcgag	tggacaagg	ccgtgcagcg	cgtgagcgcc	960
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accgaccgca	tcatcgaggt	gatccagcgc	atctaccgcg	ccttctgcaa	catccccgc	2460
cgcgctgcgc	agggcttcga	ggccgccctg	cag			2493

<210> 15

<211> 2565

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
signal sequence and gp160 coding region of HIV
strain AF110975

<400> 15

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ttctggatct	gcagcgccct	gggcaacctg	tgggtgaccg	tgtacgacgg	cgtgcccgtg	120
tggcgcgagg	ccagcaccac	cctgttctgc	gccagcgacg	ccaaggccta	cgagaaggag	180
gtgcacaacg	tgtggggccac	ccacgcctgc	gtgcccaccg	acccaaccc	ccaggagatc	240
gagctggaca	acgtgaccga	gaacttcaac	atgtggaaga	acgacatggg	ggaccagatg	300
cacgaggaca	tcatcagcct	gtgggaccag	agcctgaagc	ccgcgctgaa	gctgaccccc	360
ctgtgcgtga	ccctgaagtg	caccaactac	agcaccaact	acagcaacac	catgaacgcc	420
accagctaca	acaacaacac	caccgaggag	atcaagaact	gcaccttcaa	catgaccacc	480
gagctgcgcg	acaagaagca	gcagggtgtac	gccctgttct	acaagctgga	catcgtgccc	540
ctgaacagca	acagcagcga	gtaccgcctg	atcaactgca	acaccagcgc	catcaccacc	600
gcctgcccc	aggtgagctt	cgacccccat	cccatccact	actgcgcccc	cgccggctac	660
gccatcctga	agtgcgaaga	caacaccagc	aacggcaccg	gccccctgca	gaacgtgagc	720
accgtgcagt	gcaccaccgg	catcaagccc	gtgggtgagca	ccccctgct	gctgaacggc	780
agcctggccg	agggcggcga	gatcatcatc	cgagcaaga	acctgagcaa	caacgcctac	840
accatcatcg	tgcacctgaa	cgacagcggt	gagatcgtgt	gcacccgccc	caacaacaac	900

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acccgcaagg gcatccgcat cggccccggc cagaccttct acgccaccga gaacatcatt 960
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cgcgtagcgc ccaagctgcg cgagcatttc cccaacaaga ccacgagtt ccagcccagc 1080
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tactggggcc tggagctgaa gaagagcgcc accagcctgc tggacagcat cgccatcgcc 2460
gtggccgagg gcaccgacgc catcatcgag gtgatccag gcattaccg cgccttctgc 2520
aacatcccc cccgcgtgcg ccagggttc gaggcgccc tgacg 2565

```

<210> 16

<211> 1056

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic a
gp41 coding region of HIV strain AF110975

<400> 16

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cagagcaacc tgctgcgcgc catcgaggcc cagcagcaca tgctgcagct gaccgtgtgg 180
ggcatcaagc agctgcaggc ccgcgtgctg gccatcgagc gctacctgaa ggaccagcag 240
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ctgatcgccc tgcgcatcat cttegccgtg ctgagcatcg tgaaccgcgt gcgccagggc 600
tacagcccc tgagcttcca gacctgacc cccaaccccc gcggcctgga ccgcctgggc 660
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ttcctggccc tggcctggga cgacctgcgc agcctgtgcc tggttcagcta ccaccgcctg 780
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```

<210> 17
 <211> 492
 <212> PRT
 <213> Human immunodeficiency virus

<400> 17
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 Glu Arg Ile Arg Leu Arg Pro Gly Gly Lys Lys Cys Tyr Met Met Lys
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 His Leu Val Trp Ala Ser Arg Glu Leu Glu Lys Phe Ala Leu Asn Pro
 35 40 45
 Gly Leu Leu Glu Thr Ser Glu Gly Cys Lys Gln Ile Ile Arg Gln Leu
 50 55 60
 His Pro Ala Leu Gln Thr Gly Ser Glu Glu Leu Lys Ser Leu Phe Asn
 65 70 75 80
 Thr Val Ala Thr Leu Tyr Cys Val His Glu Lys Ile Glu Val Arg Asp
 85 90 95
 Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Cys Gln
 100 105 110
 Gln Lys Ile Gln Gln Ala Glu Ala Ala Asp Lys Gly Lys Val Ser Gln
 115 120 125
 Asn Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His Gln Ala
 130 135 140
 Ile Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu Glu Lys
 145 150 155 160
 Ala Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser Glu Gly
 165 170 175
 Ala Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly His
 180 185 190
 Gln Ala Ala Met Gln Met Leu Lys Asp Thr Ile Asn Glu Glu Ala Ala
 195 200 205
 Glu Trp Asp Arg Val His Pro Val His Ala Gly Pro Ile Ala Pro Gly
 210 215 220
 Gln Met Arg Glu Pro Arg Gly Ser Asp Ile Ala Gly Thr Thr Ser Thr
 225 230 235 240
 Leu Gln Glu Gln Ile Ala Trp Met Thr Ser Asn Pro Pro Ile Pro Val
 245 250 255
 Gly Asp Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile Val
 260 265 270

Arg Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Lys Gln Gly Pro Lys
 275 280 285
 Glu Pro Phe Arg Asp Tyr Val Asp Arg Phe Phe Lys Thr Leu Arg Ala
 290 295 300
 Glu Gln Ser Thr Gln Glu Val Lys Asn Trp Met Thr Asp Thr Leu Leu
 305 310 315 320
 Val Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Arg Ala Leu Gly
 325 330 335
 Pro Gly Ala Ser Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly
 340 345 350
 Gly Pro Ser His Lys Ala Arg Val Leu Ala Glu Ala Met Ser Gln Ala
 355 360 365
 Asn Thr Ser Val Met Met Gln Lys Ser Asn Phe Lys Gly Pro Arg Arg
 370 375 380
 Ile Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile Ala Arg Asn
 385 390 395 400
 Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly Lys Glu Gly
 405 410 415
 His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe Leu Gly Lys
 420 425 430
 Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu Gln Ser Arg
 435 440 445
 Pro Glu Pro Thr Ala Pro Pro Ala Glu Ser Phe Arg Phe Glu Glu Thr
 450 455 460
 Thr Pro Gly Gln Lys Gln Glu Ser Lys Asp Arg Glu Thr Leu Thr Ser
 465 470 475 480
 Leu Lys Ser Leu Phe Gly Asn Asp Pro Leu Ser Gln
 485 490

<210> 18

<211> 81

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
 signal sequence of HIV strain AF110968

<400> 18

atgcgcgtga tgggcatcct gaagaactac cagcagtggg ggatgtgggg catcctgggc 60
 ttctggatgc tgatcatcag c 81

<210> 19

<211> 72
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic
 signal sequence of HIV strain AF110975

<400> 19

atgcgcggtgc gcggcatcct gcgcagctgg cagcagtggt ggatctgggg catcctgggc 60
 ttctggatct gc 72

<210> 20

<211> 1479

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic Gag
 coding sequence of HIV strain AF110965

<400> 20

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 ctggagaagt tcgcctgaa ccccggcctg ctggagacca gcgagggctg caagcagatc 180
 atccgccagc tgcacccgc cctgcagacc ggcagcgagg agctgaagag cctgttcaac 240
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 ctggacaaga tcgaggagga gcagaacaag tgccagcaga agatccagca ggccgaggcc 360
 gccgacaagg gcaaggtag ccagaactac cccatcgtgc agaacctgca gggccagatg 420
 gtgcaccagg ccatcagccc ccgcaccctg aacgcctggg tgaaggtagat cgaggagaag 480
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 gacctaaca ccatgctgaa caccgtgggc ggccaccagg ccgcatgca gatgctgaag 600
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 ctgcaggagc agatgcctg gatgaccagc aacccccca tccccgtggg cgacatctac 780
 aagcgctgga tcctcctggg cctgaacaag atcgtgcgca tgtacagccc cgtgagcatc 840
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 tgccgcgccc cccgcaagaa gggctgctgg aagtgcggca aggagggccca ccagatgaag 1260
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 cccggcaact tcctgcagag ccgccccgag cccaccgccc ccccgccga gagcttccgc 1380
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<210> 21

<211> 1509

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic Gag
 coding sequence of HIV strain AF110967

<400> 21

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caccaggcca tcagccccc caccctgaac gcctgggtga aggtgatcga ggagaaggcc 480
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<210> 22

<211> 502

<212> PRT

<213> Human immunodeficiency virus

<400> 22

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Met Gly Ala Arg Ala Ser Ile Leu Arg Gly Glu Lys Leu Asp Lys Trp
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Glu Lys Ile Arg Leu Arg Pro Gly Gly Lys Lys His Tyr Met Leu Lys
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His Leu Val Trp Ala Ser Arg Glu Leu Glu Gly Phe Ala Leu Asn Pro
      35          40          45

Gly Leu Leu Glu Thr Ala Glu Gly Cys Lys Gln Ile Met Lys Gln Leu
      50          55          60

Gln Pro Ala Leu Gln Thr Gly Thr Glu Glu Leu Arg Ser Leu Tyr Asn
      65          70          75          80

Thr Val Ala Thr Leu Tyr Cys Val His Ala Gly Ile Glu Val Arg Asp
      85          90          95

Thr Lys Glu Ala Leu Asp Lys Ile Glu Glu Glu Gln Asn Lys Ser Gln
      100         105         110

Gln Lys Thr Gln Gln Ala Lys Glu Ala Asp Gly Lys Val Ser Gln Asn
      115         120         125

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Tyr Pro Ile Val Gln Asn Leu Gln Gly Gln Met Val His Gln Ala Ile
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 Ser Pro Arg Thr Leu Asn Ala Trp Val Lys Val Ile Glu Glu Lys Ala
 145 150 155 160
 Phe Ser Pro Glu Val Ile Pro Met Phe Thr Ala Leu Ser Glu Gly Ala
 165 170 175
 Thr Pro Gln Asp Leu Asn Thr Met Leu Asn Thr Val Gly Gly His Gln
 180 185 190
 Ala Ala Met Gln Met Leu Lys Asp Thr Ile Asn Glu Glu Ala Ala Glu
 195 200 205
 Trp Asp Arg Leu His Pro Val Gln Ala Gly Pro Val Ala Pro Gly Gln
 210 215 220
 Met Arg Asp Pro Arg Gly Ser Asp Ile Ala Gly Ala Thr Ser Thr Leu
 225 230 235 240
 Gln Glu Gln Ile Ala Trp Met Thr Ser Asn Pro Pro Val Pro Val Gly
 245 250 255
 Asp Ile Tyr Lys Arg Trp Ile Ile Leu Gly Leu Asn Lys Ile Val Arg
 260 265 270
 Met Tyr Ser Pro Val Ser Ile Leu Asp Ile Arg Gln Gly Pro Lys Glu
 275 280 285
 Pro Phe Arg Asp Tyr Val Asp Arg Phe Phe Lys Thr Leu Arg Ala Glu
 290 295 300
 Gln Ala Thr Gln Asp Val Lys Asn Trp Met Thr Glu Thr Leu Leu Val
 305 310 315 320
 Gln Asn Ala Asn Pro Asp Cys Lys Thr Ile Leu Arg Ala Leu Gly Pro
 325 330 335
 Gly Ala Thr Leu Glu Glu Met Met Thr Ala Cys Gln Gly Val Gly Gly
 340 345 350
 Pro Gly His Lys Ala Arg Val Leu Ala Glu Ala Met Ser Gln Ala Asn
 355 360 365
 Ser Val Asn Ile Met Met Gln Lys Ser Asn Phe Lys Gly Pro Arg Arg
 370 375 380
 Asn Val Lys Cys Phe Asn Cys Gly Lys Glu Gly His Ile Ala Lys Asn
 385 390 395 400
 Cys Arg Ala Pro Arg Lys Lys Gly Cys Trp Lys Cys Gly Lys Glu Gly
 405 410 415
 His Gln Met Lys Asp Cys Thr Glu Arg Gln Ala Asn Phe Leu Gly Lys
 420 425 430

Ile Trp Pro Ser His Lys Gly Arg Pro Gly Asn Phe Leu Gln Asn Arg
 435 440 445

Ser Glu Pro Ala Ala Pro Thr Val Pro Thr Ala Pro Pro Ala Glu Ser
 450 455 460

Phe Arg Phe Glu Glu Thr Thr Pro Ala Pro Lys Gln Glu Pro Lys Asp
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Arg Glu Pro Tyr Arg Glu Pro Leu Thr Ala Leu Arg Ser Leu Phe Gly
 485 490 495

Ser Gly Pro Leu Ser Gln
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<210> 23

<211> 849

<212> PRT

<213> Human immunodeficiency virus

<400> 23

Met Arg Val Met Gly Ile Leu Lys Asn Tyr Gln Gln Trp Trp Met Trp
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Gly Ile Leu Gly Phe Trp Met Leu Ile Ile Ser Ser Val Val Gly Asn
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Leu Trp Val Thr Val Tyr Tyr Gly Val Pro Val Trp Lys Glu Ala Lys
 35 40 45

Thr Thr Leu Phe Cys Thr Ser Asp Ala Lys Ala Tyr Glu Thr Glu Val
 50 55 60

His Asn Val Trp Ala Thr His Ala Cys Val Pro Thr Asp Pro Asn Pro
 65 70 75 80

Gln Glu Ile Val Leu Glu Asn Val Thr Glu Asn Phe Asn Met Trp Lys
 85 90 95

Asn Asp Met Val Asp Gln Met His Glu Asp Ile Ile Ser Leu Trp Asp
 100 105 110

Gln Ser Leu Lys Pro Cys Val Lys Leu Thr Pro Leu Cys Val Thr Leu
 115 120 125

Lys Cys Arg Asn Val Asn Ala Thr Asn Asn Ile Asn Ser Met Ile Asp
 130 135 140

Asn Ser Asn Lys Gly Glu Met Lys Asn Cys Ser Phe Asn Val Thr Thr
 145 150 155 160

Glu Leu Arg Asp Arg Lys Gln Glu Val His Ala Leu Phe Tyr Arg Leu
 165 170 175

Asp Val Val Pro Leu Gln Gly Asn Asn Ser Asn Glu Tyr Arg Leu Ile
 180 185 190

Asn Cys Asn Thr Ser Ala Ile Thr Gln Ala Cys Pro Lys Val Ser Phe
 195 200 205
 Asp Pro Ile Pro Ile His Tyr Cys Thr Pro Ala Gly Tyr Ala Ile Leu
 210 215 220
 Lys Cys Asn Asn Gln Thr Phe Asn Gly Thr Gly Pro Cys Asn Asn Val
 225 230 235 240
 Ser Ser Val Gln Cys Ala His Gly Ile Lys Pro Val Val Ser Thr Gln
 245 250 255
 Leu Leu Leu Asn Gly Ser Leu Ala Lys Gly Glu Ile Ile Ile Arg Ser
 260 265 270
 Glu Asn Leu Ala Asn Asn Ala Lys Ile Ile Ile Val Gln Leu Asn Lys
 275 280 285
 Pro Val Lys Ile Val Cys Val Arg Pro Asn Asn Asn Thr Arg Lys Ser
 290 295 300
 Val Arg Ile Gly Pro Gly Gln Thr Phe Tyr Ala Thr Gly Glu Ile Ile
 305 310 315 320
 Gly Asp Ile Arg Gln Ala Tyr Cys Ile Ile Asn Lys Thr Glu Trp Asn
 325 330 335
 Ser Thr Leu Gln Gly Val Ser Lys Lys Leu Glu Glu His Phe Ser Lys
 340 345 350
 Lys Ala Ile Lys Phe Glu Pro Ser Ser Gly Gly Asp Leu Glu Ile Thr
 355 360 365
 Thr His Ser Phe Asn Cys Arg Gly Glu Phe Phe Tyr Cys Asp Thr Ser
 370 375 380
 Gln Leu Phe Asn Ser Thr Tyr Ser Pro Ser Phe Asn Gly Thr Glu Asn
 385 390 395 400
 Lys Leu Asn Gly Thr Ile Thr Ile Thr Cys Arg Ile Lys Gln Ile Ile
 405 410 415
 Asn Met Trp Gln Lys Val Gly Arg Ala Met Tyr Ala Pro Pro Ile Ala
 420 425 430
 Gly Asn Leu Thr Cys Glu Ser Asn Ile Thr Gly Leu Leu Leu Thr Arg
 435 440 445
 Asp Gly Gly Lys Thr Gly Pro Asn Asp Thr Glu Ile Phe Arg Pro Gly
 450 455 460
 Gly Gly Asp Met Arg Asp Asn Trp Arg Asn Glu Leu Tyr Lys Tyr Lys
 465 470 475 480
 Val Val Glu Ile Lys Pro Leu Gly Val Ala Pro Thr Glu Ala Lys Arg
 485 490 495

Arg Val Val Glu Arg Glu Lys Arg Ala Val Gly Ile Gly Ala Val Phe
 500 505 510
 Leu Gly Phe Leu Gly Ala Ala Gly Ser Thr Met Gly Ala Ala Ser Ile
 515 520 525
 Thr Leu Thr Val Gln Ala Arg Leu Leu Leu Ser Gly Ile Val Gln Gln
 530 535 540
 Gln Asn Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln His Leu Leu Gln
 545 550 555 560
 Leu Thr Val Trp Gly Ile Lys Gln Leu Gln Thr Arg Ile Leu Ala Val
 565 570 575
 Glu Arg Tyr Leu Lys Asp Gln Gln Leu Leu Gly Ile Trp Gly Cys Ser
 580 585 590
 Gly Lys Leu Ile Cys Thr Thr Ala Val Pro Trp Asn Ser Ser Trp Ser
 595 600 605
 Asn Arg Ser His Asp Glu Ile Trp Asp Asn Met Thr Trp Met Gln Trp
 610 615 620
 Asp Arg Glu Ile Asn Asn Tyr Thr Asp Thr Ile Tyr Arg Leu Leu Glu
 625 630 635 640
 Glu Ser Gln Asn Gln Gln Glu Lys Asn Glu Lys Asp Leu Leu Ala Leu
 645 650 655
 Asp Ser Trp Gln Asn Leu Trp Asn Trp Phe Ser Ile Thr Asn Trp Leu
 660 665 670
 Trp Tyr Ile Lys Ile Phe Ile Met Ile Val Gly Gly Leu Ile Gly Leu
 675 680 685
 Arg Ile Ile Phe Ala Val Leu Ser Ile Val Asn Arg Val Arg Gln Gly
 690 695 700
 Tyr Ser Pro Leu Pro Phe Gln Thr Leu Thr Pro Asn Pro Arg Glu Pro
 705 710 715 720
 Asp Arg Leu Gly Arg Ile Glu Glu Glu Gly Gly Glu Gln Asp Arg Gly
 725 730 735
 Arg Ser Ile Arg Leu Val Ser Gly Phe Leu Ala Leu Ala Trp Asp Asp
 740 745 750
 Leu Arg Ser Leu Cys Leu Phe Ser Tyr His Arg Leu Arg Asp Phe Ile
 755 760 765
 Leu Ile Ala Ala Arg Val Leu Glu Leu Leu Gly Gln Arg Gly Trp Glu
 770 775 780
 Ala Leu Lys Tyr Leu Gly Ser Leu Val Gln Tyr Trp Gly Leu Glu Leu
 785 790 795 800

Lys Lys Ser Ala Ile Ser Leu Leu Asp Thr Ile Ala Ile Ala Val Ala
805 810 815

Glu Gly Thr Asp Arg Ile Ile Glu Phe Ile Gln Arg Ile Cys Arg Ala
820 825 830

Ile Arg Asn Ile Pro Arg Arg Ile Arg Gln Gly Phe Glu Ala Ala Leu
835 840 845

Gln

<210> 24

<211> 855

<212> PRT

<213> Human immunodeficiency virus

<400> 24

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20 25 30

Thr Val Tyr Asp Gly Val Pro Val Trp Arg Glu Ala Ser Thr Thr Leu
35 40 45

Phe Cys Ala Ser Asp Ala Lys Ala Tyr Glu Lys Glu Val His Asn Val
50 55 60

Trp Ala Thr His Ala Cys Val Pro Thr Asp Pro Asn Pro Gln Glu Ile
65 70 75 80

Glu Leu Asp Asn Val Thr Glu Asn Phe Asn Met Trp Lys Asn Asp Met
85 90 95

Val Asp Gln Met His Glu Asp Ile Ile Ser Leu Trp Asp Gln Ser Leu
100 105 110

Lys Pro Arg Val Lys Leu Thr Pro Leu Cys Val Thr Leu Lys Cys Thr
115 120 125

Asn Tyr Ser Thr Asn Tyr Ser Asn Thr Met Asn Ala Thr Ser Tyr Asn
130 135 140

Asn Asn Thr Thr Glu Glu Ile Lys Asn Cys Thr Phe Asn Met Thr Thr
145 150 155 160

Glu Leu Arg Asp Lys Lys Gln Gln Val Tyr Ala Leu Phe Tyr Lys Leu
165 170 175

Asp Ile Val Pro Leu Asn Ser Asn Ser Ser Glu Tyr Arg Leu Ile Asn
180 185 190

Cys Asn Thr Ser Ala Ile Thr Gln Ala Cys Pro Lys Val Ser Phe Asp
195 200 205

Pro Ile Pro Ile His Tyr Cys Ala Pro Ala Gly Tyr Ala Ile Leu Lys
 210 215 220
 Cys Lys Asn Asn Thr Ser Asn Gly Thr Gly Pro Cys Gln Asn Val Ser
 225 230 235 240
 Thr Val Gln Cys Thr His Gly Ile Lys Pro Val Val Ser Thr Pro Leu
 245 250 255
 Leu Leu Asn Gly Ser Leu Ala Glu Gly Gly Glu Ile Ile Ile Arg Ser
 260 265 270
 Lys Asn Leu Ser Asn Asn Ala Tyr Thr Ile Ile Val His Leu Asn Asp
 275 280 285
 Ser Val Glu Ile Val Cys Thr Arg Pro Asn Asn Asn Thr Arg Lys Gly
 290 295 300
 Ile Arg Ile Gly Pro Gly Gln Thr Phe Tyr Ala Thr Glu Asn Ile Ile
 305 310 315 320
 Gly Asp Ile Arg Gln Ala His Cys Asn Ile Ser Ala Gly Glu Trp Asn
 325 330 335
 Lys Ala Val Gln Arg Val Ser Ala Lys Leu Arg Glu His Phe Pro Asn
 340 345 350
 Lys Thr Ile Glu Phe Gln Pro Ser Ser Gly Gly Asp Leu Glu Ile Thr
 355 360 365
 Thr His Ser Phe Asn Cys Arg Gly Glu Phe Phe Tyr Cys Asn Thr Ser
 370 375 380
 Lys Leu Phe Asn Ser Ser Tyr Asn Gly Thr Ser Tyr Arg Gly Thr Glu
 385 390 395 400
 Ser Asn Ser Ser Ile Ile Thr Leu Pro Cys Arg Ile Lys Gln Ile Ile
 405 410 415
 Asp Met Trp Gln Lys Val Gly Arg Ala Ile Tyr Ala Pro Pro Ile Glu
 420 425 430
 Gly Asn Ile Thr Cys Ser Ser Ser Ile Thr Gly Leu Leu Leu Ala Arg
 435 440 445
 Asp Gly Gly Leu Asp Asn Ile Thr Thr Glu Ile Phe Arg Pro Gln Gly
 450 455 460
 Gly Asp Met Lys Asp Asn Trp Arg Asn Glu Leu Tyr Lys Tyr Lys Val
 465 470 475 480
 Val Glu Ile Lys Pro Leu Gly Val Ala Pro Thr Glu Ala Lys Arg Arg
 485 490 495
 Val Val Glu Arg Glu Lys Arg Ala Val Gly Ile Gly Ala Val Ile Phe
 500 505 510

Gly Phe Leu Gly Ala Ala Gly Ser Asn Met Gly Ala Ala Ser Ile Thr
 515 520 525
 Leu Thr Ala Gln Ala Arg Gln Leu Leu Ser Gly Ile Val Gln Gln Gln
 530 535 540
 Ser Asn Leu Leu Arg Ala Ile Glu Ala Gln Gln His Met Leu Gln Leu
 545 550 555 560
 Thr Val Trp Gly Ile Lys Gln Leu Gln Ala Arg Val Leu Ala Ile Glu
 565 570 575
 Arg Tyr Leu Lys Asp Gln Gln Leu Leu Gly Ile Trp Gly Cys Ser Gly
 580 585 590
 Lys Leu Ile Cys Thr Thr Thr Val Pro Trp Asn Ser Ser Trp Ser Asn
 595 600 605
 Lys Thr Gln Gly Glu Ile Trp Glu Asn Met Thr Trp Met Gln Trp Asp
 610 615 620
 Lys Glu Ile Ser Asn Tyr Thr Gly Ile Ile Tyr Arg Leu Leu Glu Glu
 625 630 635 640
 Ser Gln Asn Gln Gln Glu Gln Asn Glu Lys Asp Leu Leu Ala Leu Asp
 645 650 655
 Ser Arg Asn Asn Leu Trp Ser Trp Phe Asn Ile Ser Asn Trp Leu Trp
 660 665 670
 Tyr Ile Lys Ile Phe Ile Met Ile Val Gly Gly Leu Ile Gly Leu Arg
 675 680 685
 Ile Ile Phe Ala Val Leu Ser Ile Val Asn Arg Val Arg Gln Gly Tyr
 690 695 700
 Ser Pro Leu Ser Phe Gln Thr Leu Thr Pro Asn Pro Arg Gly Leu Asp
 705 710 715 720
 Arg Leu Gly Arg Ile Glu Glu Glu Gly Gly Glu Gln Asp Arg Asp Arg
 725 730 735
 Ser Ile Arg Leu Val Gln Gly Phe Leu Ala Leu Ala Trp Asp Asp Leu
 740 745 750
 Arg Ser Leu Cys Leu Phe Ser Tyr His Arg Leu Arg Asp Leu Ile Leu
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 Val Thr Ala Arg Val Val Glu Leu Leu Gly Arg Ser Ser Pro Arg Gly
 770 775 780
 Leu Gln Arg Gly Trp Glu Ala Leu Lys Tyr Leu Gly Ser Leu Val Gln
 785 790 795 800
 Tyr Trp Gly Leu Glu Leu Lys Lys Ser Ala Thr Ser Leu Leu Asp Ser
 805 810 815

Ile Ala Ile Ala Val Ala Glu Gly Thr Asp Arg Ile Ile Glu Val Ile
820 825 830

Gln Arg Ile Tyr Arg Ala Phe Cys Asn Ile Pro Arg Arg Val Arg Gln
835 840 845

Gly Phe Glu Ala Ala Leu Gln
850 855

<210> 25
<211> 20
<212> PRT
<213> Human immunodeficiency virus

<400> 25
Asp Ile Lys Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg
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Phe Phe Lys Thr
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<210> 26
<211> 60
<212> DNA
<213> Human immunodeficiency virus

<400> 26
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<210> 27
<211> 20
<212> PRT
<213> Human immunodeficiency virus

<400> 27
Asp Ile Arg Gln Gly Pro Lys Glu Pro Phe Arg Asp Tyr Val Asp Arg
1 5 10 15

Phe Phe Lys Thr
20

<210> 28
<211> 47
<212> PRT
<213> Human immunodeficiency virus

<400> 28
Thr Ile Thr Ile Thr Cys Arg Ile Lys Gln Ile Ile Asn Met Trp Gln
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Lys Val Gly Arg Ala Met Tyr Ala Pro Pro Ile Ala Gly Asn Leu Thr
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Cys Glu Ser Asn Ile Thr Gly Leu Leu Leu Thr Arg Asp Gly Gly

<210> 29
 <211> 48
 <212> PRT
 <213> Human immunodeficiency virus

<400> 29
 Ser Ile Ile Thr Leu Pro Cys Arg Ile Lys Gln Ile Ile Asp Met Trp
 1 5 10 15
 Gln Lys Val Gly Arg Ala Ile Tyr Ala Pro Pro Ile Glu Gly Asn Ile
 20 25 30
 Thr Cys Ser Ser Ser Ile Thr Gly Leu Leu Leu Ala Arg Asp Gly Gly
 35 40 45

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 <211> 2469
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: PR975(+)

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 ggccaccaga tgaaggactg caccgagcgc caggccaact tcttccgcga ggacctggcc 240
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 gacggcccca aggtgaagca gtggccccctg accgaggaga agatcaaggc cctgaccgcc 780
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 aacgagaccc ccggcatccg ctaccagtac aacgtgctgc ccagggctg gaagggcagc 1140
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 cgccagctgt gcaagctgct gcgcggcgcc aaggccctga ccgacatcgt gcccctgacc 1560
 gaggaggccg agctggagct ggccgagaac cgcgagatcc tgcgcgagcc cgtgcacggc 1620
 gtgtactacg accccagcaa ggacctgggtg gccgagatcc agaagcaggg ccacgaccag 1680
 tggacctacc agatctacca ggagcccttc aagaacctga agaccggcaa gtacgccaag 1740

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gtgaacaccc cccccctggt gaagctgtgg taccagctgg agaaggagcc catcatcgcc 1980
gccgagacct tctacgtgga cggcgccgcc aaccgcgaga ccaagatcgg caaggccggc 2040
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<210> 31

<211> 2463

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: PR975YM

<400> 31

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cacatcgccc gcaactgccg cggccccgc aagaagggt gctggaagt cggaaggag 180
ggccaccaga tgaaggactg caccgagcgc caggccaact tcttcgcga ggacctggcc 240
ttccccagg gcaaggcccc cgagttcccc agcgagcaga accgcgcaa cagccccacc 300
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atgagcctgc ccggcaagtg gaagcccaag atgatcggcg gcatcggcgg cttcatcaag 540
gtgcccagc acgaccagat cctgatcgag atctgcggca agaaggccat cggcaccgtg 600
ctgatcgccc ccaccctcag gaacatcatc ggcgcgaaca tgctgacca gctgggctgc 660
accctgaact tccccatcag ccccatcgag accgtgcccc tgaagctgaa gcccggcag 720
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<212> DNA

<213> Human immunodeficiency virus

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<210> 37
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<213> Human immunodeficiency virus

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<210> 46

<211> 97

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C
Env Optimized common region short

<400> 46
catcaccctg cagtgcaga tcaagcagat cgtgcgcatg tggcagggcg tgggccaggc 60
catgtacgcc ccccccatcg ccggcaacat cacctgc 97

<210> 47
<211> 144
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: HIV Type C Env
Optimized common region

<400> 47
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caggccatgt acgccccccc catcgccggc aacatcacct gccgcagcaa catcaccggc 120
atcctgctga ccgcgcagcg cggc 144

<210> 48
<211> 144
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: HIV Type C Env
wild type common region

<400> 48
ttacccatca cactccaatg caaaataaaa caaattgtac gcatgtggca aggggtagga 60
caagcaatgt atgcccctcc cattgcagga aacataacat gtagatcaaa catcacagga 120
atactattga cacgtgatgg ggga 144

<210> 49
<211> 2610
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: HIV Type C
Envgp160 optimized

<400> 49
atgcgcgtga tgggcaccca gaagaactgc cagcagtggt ggatctgggg catcctgggc 60
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cccgtgtggc gcgaggccaa gaccaccctg ttctgcgcca gcgacgcaa ggcctacgag 180
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accgaccgct ggaacaagac cctgcagcag gtgatgaaga agctgggcca gcaattcccc 1080
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taccccaaga acggcaccta caagtacaac ggcaacagca gcctgcccat caccctgcag 1260
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cgcatcatcg agctggtgca gcgcatctgc cgcgcatcc tgaacatccc ccgcccgcac 2580
cgccagggtc tcgaggccgc cctgctgtaa 2610

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<210> 50

<211> 2610

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:HIV Type C
Envgp160 wild type

<400> 50

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ttctggatgc taatgatttg taacacggag gacttgtggg tcacagtcta ctatgggta 120
cctgtgtgga gagaagcaaa aactactcta ttctgtgcat cagatgctaa agcatatgag 180
acagaagtgc ataatgtctg ggctacacat gcttgtgtac ccacagaccc caaccacaa 240
gaaatagttt tgggaaatgt aacagaaaat ttaatatgt ggaaaaataa catggcagat 300
cagatgcagtg aggatataat cagtttatgg gatcaaagcc taaagccatg tgtaaagttg 360
acccactct gtgtcacttt aaactgtaca gatacaaatg ttacaggtaa tagaactgtt 420
acaggtaata caaatgatac caatattgca aatgctacat ataagtatga agaaatgaaa 480
aattgctctt tcaatgcaac cacagaatta agagataaga aacataaaga gtatgcactc 540
ttttataaac ttgatatagt accacttaat gaaaatagta acaactttac atatagatta 600
ataaattgca atacctcaac cataacacaa gcctgtccaa aggtctcttt tgacccgatt 660
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aatgggacag gacctgttta taatgtcagc acagtacaat gtacacatgg aattaagcca 780
gtggtatcaa ctcaactact gttaaatggg agtctagcag aagaagggat aataattaga 840
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attaattgta caaggcccaa caataatata aggaaaagtg taaggatagg accaggacaa 960
gcattctatg caacaaatga cgtaatatga aacataagac aagcacattg taacattagt 1020

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acagatagat	ggaataaaac	tttacaacag	gtaatgaaa	aattaggaga	gcatttcct	1080
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aggattatag	aattggtaga	aagaatttgt	agagctatcc	tcaacatacc	taggagaata	2580
agacagggct	ttgaagcagc	tttgctataa				2610

<210> 51

<211> 1494

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C
Gag optimized

<400> 51

atgggccc	gcgccagcat	cctgagcggc	ggcaagctgg	acaagtggga	gcgcatccgc	60
ctgcgcccc	gcggcaagaa	gcactacatg	ctgaagcacc	tggtgtgggc	cagccgcgag	120
ctggagcgt	tcgccctgaa	ccccggcctg	ctggagacca	gcgagggtg	caagcagatc	180
atcaagcagc	tgccagccgc	cctgcagacc	ggcaccgagg	agctgcgcag	cctgttcaac	240
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ctggacaaga	tcgaggagga	gcagaacaag	tgccagcaga	aggcccagca	ggccaaggcc	360
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gccgaggcca	tgagccaggc	caacagcaac	atcctggtgc	agcgagcaa	cttcaagggc	1140

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agcaaccgca tcatcaagtg cttcaactgc ggcaagggtg gccacatcgc ccgcaactgc 1200
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cccgcgagga gcttccgctt cgaggagacc acccccgtgc cccgcaagga gaaggagcgc 1440
gagcccctga ccagcctgaa gagcctgttc ggcagcgacc ccctgagcca gtaa 1494

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<210> 52

<211> 1494

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C Gag
Wild Type

<400> 52

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atgggtgcga gagcgtcaat attaagcggc ggaaaattag ataatggga aagaattagg 60
ttaaggccag ggggaaagaa acattatatg ttaaaacatc tagtatgggc aagcaggagg 120
ctggaaagat ttgcacttaa ccctggcctg ttagaaacat cagaaggctg taaacaaata 180
ataaaacagc tacaaccagc tcttcagaca ggaacagagg aacttagatc attattcaac 240
acagtagcaa ctctctattg tgtacataaa gggatagagg tacgagacac caaggaagcc 300
ttagacaaga tagaggaaga aaaaaacaaa tgtcagcaaa aagcacaaca ggcaaaagca 360
gctgacgaaa aggtcagtcg aaattatcct atagtacaga atgcccagg gcaaatggta 420
caccaagcta tatcacctag aacattgaat gcattggata aagtaataga ggaaaaggct 480
ttcaatccag aggaaatacc catgtttaca gcattatcag aaggagccac cccacaagat 540
ttaaacacaa tgttaaatac agtgggggga catcaagcag ccatgcaaat gttaaaagat 600
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gaacctttaa cttccctcaa atcactctt ggacgcgacc cttgtctca ataa 1494

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<210> 53

<211> 60

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C Gag
Major Homology Region Optimized

<400> 53

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gacatcaagc agggccccaa ggagcccttc cgcgactacg tggaccgctt ctccaagacc 60

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<210> 54

<211> 60

<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C Gag
Major Homology Region Wild Type

<400> 54

gacataaaac aaggggccaaa agaacccttt agagactatg tagaccgggt ctttaaaacc 60

<210> 55

<211> 624

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C Nef
Optimized

<400> 55

atgggaggca agtggagcaa ggcgagcatc gtgggctggc ccgccgtgcg cgagcgcatg 60
cgccgcaccg agcccgccgc cgagggcggtg ggcgccgcca gccaggacct ggaccgccac 120
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cccaggtact acaaggactg ctga 624

<210> 56

<211> 624

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C Nef
Wild Type

<400> 56

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agaagaactg agccagcagc agagggagta ggagcagcgt ctcaagactt agatagacat 120
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caagaggagg acggagatgt aggttttcca gtcagacctc aggtaccttt aagaccaatg 240
acttataaga gtgcagtaga tctcagcttc tttttaaag aaaagggggg actggaaggg 300
ttaatttact ctaggaaaag gcaagaaatc cttgatttgt ggggtctataa cacacaaggc 360
ttcttccttg attggcaaaa ctacacatcg gggccagggg tccgattccc actgaccttt 420
ggatggtgct tcaagctagt accagttgac ccaagggagg tgaagaggc caatgaagga 480
gaagacaact gtttgctaca ccctatgagc caacatggag cagaggatga agatagagaa 540
gtattaaagt ggaagtttga cagccttcta gcacacagac acatggcccc cgagctacat 600
ccggagtatt acaagactg ctga 624

<210> 57

<211> 624

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C
NefD125G Optimized

<400> 57

```
atgggcgga agtggagcaa ggcgagcatc gtgggctggc ccgccgtgcg cgagcgcacg 60
cgccgcaccg agcccgccgc cgagggcggt ggcccgcca gccaggacct ggaccgccac 120
ggcgccctga ccagcagcaa ccccccgcc accaacgagg cctgcgcctg gctgcaggcc 180
caggaggagg acggcgacgt gggcttcccc gtgcgcccc aggtgcccc gcgccccatg 240
acctacaaga ggcgctgga cctgagcttc ttctgaagg agaaggcgcg cctggagggc 300
ctgatctaca gccgcaagcg ccaggagatc ctggacctgt ggggtgtaca caccagggc 360
ttcttccccg gctggcagaa ctacaccagc ggccccggcg tgcgcttccc cctgaccttc 420
ggctggtgct tcaagctggt gcccgtggac ccccgcgagg tgaaggaggc caacgagggc 480
gaggacaact gcctgctgca ccccatgagc cagcacggcg ccgaggacga ggaccgcgag 540
gtgctgaagt ggaagtctga cagcctgctg gccaccgcc acatggcccc cgagctgcac 600
cccagtgact acaaggactg ctga 624
```

<210> 58

<211> 354

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C
p15RNaseH Optimized

<400> 58

```
accttctacg tggacggcg caccaaccgc gaggccaaga tcggcaaggc cggctacgtg 60
accgaccgag gccgccagaa gatcgtgacc ctgaccaaca ccaccaacca gaagaccgag 120
ctgcaggcca tccagctggc cctgcaggac agcggcagcg aggtgaacat cgtgaccgac 180
agccagtacg ccctgggcat catccaggcc cagcccgaca agagcgacag cgagatcttc 240
aaccagatca tcgagcagct gatcaacaag gagcgcacat acctgagctg ggtgcccgcc 300
cacaagggca tcggcgga caagcagggt gacaagctgg tgagcaaggc catc 354
```

<210> 59

<211> 354

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C
p15RNaseH Wild Type

<400> 59

```
actttctatg tagatggagc aactaatagg gaagctaaaa taggaaaagc agggatatgtt 60
actgacagag gaaggcagaa aattgttact ctaactaaca caacaaatca gaagactgag 120
ttacaagcaa ttcagctagc tctgcaggat tcaggatcag aagtaaacad agtaacagac 180
tcacagtatg cattaggaat cattcaagca caaccagata agagtgactc agagatattt 240
aaccataata tagaacagtt aataaacaag gaaagaatct acctgtcatg ggtaccagca 300
cataaaggaa ttgggggaaa tgaacaagta gataaattag taagtaaggg aatt 354
```

<210> 60

<211> 876

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C
p31Int Optimized

<400> 60

```
cgcaaggtgc tgttcctgga cggcatcgac aaggcccagg aggagcacga gcgctaccac 60
agcaactggc gcgccatggc caacgagttc aacctgcccc ccatcgtggc caaggagatc 120
gtggccagct gcgacaagtgc ccagctgaag ggcgaggcca tccacggcca ggtggactgc 180
agccccggca tctggcagct ggactgcacc cacctggagg gcaagatcat cctggtggcc 240
gtgcacgtgg ccagcggcta catggaggcc gaggtgatcc ccgccgagac cggccaggag 300
accgcctact tcatcctgaa gctggccggc cgctggcccg tgaaggtgat ccacaccgac 360
aacggcagca acttcaccag caccgccgtg aaggccgctt gctggtgggc cggcatccag 420
caggagttcg gcacccccta caacccccag agccaggggc tgggtggagag catgaacaag 480
gagctgaaga agatcatcgg ccaggtgcgc gaccaggccg agcacctgaa gaccgcccgtg 540
cagatggccg tgttcattcca caacttcaag cgcaaggggc gcatcggcgg ctacagcgcc 600
ggcgagcgca tcatcgacat catcgccacc gacatccaga ccaaggagct gcagaagcag 660
atcatccgca tccagaactt ccgctgtgac taccgcgaca gccgcgaccc catctggaag 720
ggccccggcg agctgctgtg gaaggcgag ggcgtggtgg tgatcgagga caaggcgac 780
atcaaggtgg tgccccggcg caaggccaag atcatccgcg actacggcaa gcagatggcc 840
ggcgccgact gcgtggccgg cggccaggac gaggac 876
```

<210> 61

<211> 876

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C
p31Int Wild Type

<400> 61

```
aggaaagtgt tgtttctaga tggaatagat aaagtcaag aagagcatga aaggtaccac 60
agcaattgga gagcaatggc taatgagttt aatctgccac ccatagtagc aaaagaaata 120
gtagctagct gtgataaatg tcagctaaaa ggggaagcca tacatggaca agtcgactgt 180
agtccaggga tatggcaatt agattgtacc catttagagg gaaaaatcat cctggttagc 240
gtccatgtag ctagtggcta catggaagca gaggttatcc cagcagaaac aggacaagaa 300
acagcatatt ttatattaaa attagcagga agatggccag tcaaagtaat acatacagac 360
aatggcagta attttaccag tactgcagtt aaggcagcct gttggtgggc aggtatccaa 420
caggaatttg gaattcccta caatcccaa agtcaggagg tggtagaatc catgaataaa 480
gaattaaaga aaataatagg acaagtaaga gatcaagctg agcaccttaa gacagcagta 540
caaattggcag tattcattca caattttaaa agaaaagggg gaattggggg gtacagtgcg 600
ggggaagaa taatagacat aatagcaaca gacatacaaa ctaaaagaatt acaaaaacaa 660
attataagaa ttcaaaattt tcgggtttat tacagagaca gcagagaccc tatttggaag 720
ggaccagccg aactactctg gaaaggtgaa ggggtagtag taatagaaga taaaggtgac 780
ataaaggtag taccaaggag gaaagcaaaa atcattagag attatggaaa acagatggca 840
ggtgctgatt gtgtggcagg tggacaggat gaagat 876
```

<210> 62

<211> 3015

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C
Pol Optimized

<400> 62

```
ttcttccgcg agaacctggc cttccccag ggcgaggccc gcgagttccc ccccgagcag 60
accgcgcgca acagcccccac cagccgcacc aacagcccca ccagccgcga gctgcaggtg 120
cgcgccgaca acccccgcgc cgaggagggc gagcgcgagg gcaccttcaa cttccccag 180
atcacctgtt ggcagcgccc cctggtgagc atcaagggtg agggccagat caaggaggcc 240
ctgctggaca cggcgccga cgacaccgtg ctggaggaga tcgacctgcc cggcaagtgg 300
aagcccaaga tgatcggcgg catcggcggc ttcataagg tgcgccagta cgaccagatc 360
ctgatcgaga tctgcggcaa gaaggccatc ggcaccgtgc tggtagggccc ccccccggtg 420
aacatcatcg gccgcaacct gctgaccag ctgggtgca ccctgaactt ccccatcagc 480
cccatcgaga ccgtgcccggt gaagctgaag cccggcatgg acggcccca ggtagagcag 540
tggcccttga ccgaggagaa gatcaaggcc ctgaccgcca tctgcgagga gatggagaag 600
gaggccaaga tcaccaagat cgccccgac aaccttaca acaccccggt gttcgccatc 660
aagaagaagg acagcaccaa gtggcgcaag ctgggtgact tccgcgagct gaacaagcgc 720
accaggact tctgggaggt gcagctgggc atccccacc ccgcccgcct gaagaagaag 780
aagagcgtga ccgtgctgga cgtggcgac gcctacttca gcgtgcccc ggacgagagc 840
ttccgcaagt acaccgcctt caccatcccc agcatcaaca acgagacccc cggcatccgc 900
taccagtaca acgtgctgcc ccagggtggt aagggcagcc ccgcatctt ccagagcagc 960
atgaccaaga tcttgagcc cttccgcgcc aagaacccc acatcgtgat ctaccagtac 1020
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gagctgcgcg agcacctgt gaagtggggc ttcaccacc ccgacaagaa gcaccagaag 1140
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gccgagaacc gcgagatcct ggcgagccc gtgcacggcg tgtactacga cccagcaag 1440
gacctgatcg ccgagatcca gaagcagggc cagcagcagt ggacctacca gatctaccag 1500
gagcccttca agaacctgaa gaccggcaag tacgccaaaga tgcgcaccac ccacaccaac 1560
gacgtgaagc agctgaccga ggcctgtag aagatcgcca tggagagcat cgtgatctgg 1620
ggcaagaccc ccaagttccg cctgcccac cagaaggaga cctgggagac ctggtggacc 1680
gactactggc aggcacctg gatccccgag tgggagttcg tgaacacccc cccctggtg 1740
aagctgtggt accagctgga gaaggacccc atcgccggcg tggagacctt ctacgtggac 1800
ggcgccacca accgcgaggg caagatcggc aaggccggct acgtgaccga ccgcgccgc 1860
cagaagatcg tgacctgac caacaccacc aaccagaaga ccgagctgca ggccatccag 1920
ctggccctgc aggacagcg cgacaggtg aacatcgtga ccgacgcca gtacgccctg 1980
ggcatcatcc aggcacgac cgacaagagc gacagcgaga tcttcaacca gatcatcgag 2040
cagctgatca acaaggagcg catctacctg agctgggtgc ccgccacaa gggcatcggc 2100
ggcaacgagc aggtggacaa gctggtgagc aaggcatcc gcaaggtgct gttcctggac 2160
ggcatcgaca agggccagga ggagcacgag cgctaccaca gcaactggcg cgccatggcc 2220
aacgagttca acctgcccc catcgtggcc aaggagatcg tggccagctg cgacaagtgc 2280
cagctgaagg gcgaggccat ccacggccag gtggactgca gccccggcat ctggcagctg 2340
gactgcaccc acctggagg caagatcatc ctggtggccg tgcacgtggc cagcggctac 2400
atggaggccg aggtgatccc cgccgagacc ggccaggaga ccgcctactt catcctgaag 2460
ctggccggcc gctggccgt gaaggtgatc cacaccgaca acggcagcaa cttaccagc 2520
accgccgtga agggccgctg ctggtgggccc ggcacccagc aggagttcgg catcccctac 2580
aacccccaga gccaggcggt ggtggagagc atgaacaagg agctgaagaa gatcatcggc 2640
caggtgcgcg accaggccga gcacctgaag accgcgtgc agatggccgt gttcatccac 2700
aacttcaagc gcaaggcgcg catcgcggc tacagcgccg gcgagcgcac catcgacatc 2760
atcgccaccg acctccagac caaggagctg cagaagcaga tcatccgcac ccagaacttc 2820
cgcggtgact accgcgacag ccgcgacccc atctggaagg gccccgccga gctgctgtgg 2880
aagggcgagg gcgtggtggt gatcgaggac aagggcgaca tcaagggtgt gccccgccg 2940
aaggccaaga tcatccgcga ctacggcaag cagatggccg gcgcccagct cgtggccggc 3000
ggccaggacg aggcac 3015
```

<210> 63

<211> 3015

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C
Pol Wild Type

<400> 63

```
tttttttaggg aaaatttggc cttcccacaa ggggaggcca ggaatttcc tccagaacag 60
accagagcca acagcccac cagcagaacc aacagcccca ccagcagaga gcttcagggt 120
cgaggagaca accccgtgc cgaggaagga gaaagagagg gaaccttta cttccctcaa 180
atcactcttt ggcagcgacc ccttgtctca ataaaagtag agggccagat aaaggagggt 240
ctcttagaca caggagcaga tgatacagta ttagaagaaa tagatttgcc agggaaatgg 300
aaacaaaaaa tgataggggg aattggaggt ttatcaaag taagacagta tgatcaaata 360
cttatagaaa tttgtgga aaaggctata ggtacagtat tagtagggcc tacaccagtc 420
aacataattg gaagaaatct gttaactcag cttggatgca cactaaattt tccaattagt 480
cctattgaaa ctgtaccagt aaaattaaaa ccaggaatgg atggcccaa ggtcaaacaa 540
tggccattga cagaagaaaa aataaaagca ttaacagcaa tttgtgagga aatggagaag 600
gaaggaaaaa ttacaaaaat tgggcctgat aatccatata acactccagt atttgccata 660
aaaaagaagg acagtactaa gtggagaaaa ttagtagatt tcagggaact caataaaga 720
actcaagact tttgggaagt tcaattagga ataccacacc cagcaggatt aaaaaagaa 780
aatcagtgga cagtgtcaga tgtgggggat gcatattttt cagttccttt agatgaaagc 840
ttcaggaaat atactgcatt caccatacct agtataaaca atgaaacacc agggattaga 900
tatcaatata atgtgtgcc acagggatgg aaaggatcac cagcaatatt ccagagtagc 960
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atggatgact tgtatgtagg atctgactta gaaatagggc aacatagagc aaaaatagaa 1080
gagttaaggg aacatttatt gaaatgggga tttacaacac cagacaagaa acatcaaaaa 1140
gaaccccat tctttggat ggggtatgaa tccatcctg acaaatggac agtacaacct 1200
atactgtgc cagaaaagga tagttggact gtcaatgata tacagaagtt agtgggaaaa 1260
ttaactggg caagtcagat ttaccagggt attaaagtaa ggcaactctg taaactcctc 1320
aggggggcca aagcactaac agacatagta ccactaactg aagaagcaga attagaattg 1380
gcagagaaca gggaaatttt aagagaacca gtacatggag tatattatga tccatcaaaa 1440
gacttgatag ctgaaatata gaaacagggg catgaacaat ggacatatca aatttatcaa 1500
gaaccattta aaaatctgaa aacaggggaag tatgcaaaaa tgaggactac ccacactaat 1560
agtgtaaaac agttaaagga ggcagtgc aaatagcca tggaaagcat agtaatatgg 1620
ggaaagactc ctaaaatttag actaccatc caaaaagaaa catgggagac atgggtggaca 1680
gactattggc aagccacctg gatccctgag tgggagttt ttaatacccc tcccctagta 1740
aaattatgg accaactaga aaaagatccc atagcaggag tagaaacttt ctatgtagat 1800
ggagcaacta atagggaagc taaaatagga aaagcagggt atgttactga cagaggaagg 1860
cagaaaattg ttactctaac taacacaaca aatcagaaga ctgagttaca agcaattcag 1920
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cagttaataa acaaggaaag aatctacctg tcatgggtac cagcacataa aggaattggg 2100
ggaaatgaac aagtagataa attagtaagt aagggaatta ggaaagtgtt gtttctagat 2160
ggaatagata aagctcaaga agagcatgaa aggtaccaca gcaattggag agcaatggct 2220
aatgagttta atctgccacc catagtagca aaagaaatag tagctagctg tgataaatgt 2280
cagctaaaag gggaaagccat acatggacaa gtcgactgta gtccagggat atggcaatta 2340
gattgtaccc atttagaggg aaaaatcatc ctggtagcag tccatgtagc tagtggctac 2400
atggaagcag aggttatccc agcagaaaca ggacaagaaa cagcatattt tatattaaaa 2460
ttagcaggaa gatggccagt caaagtaata catacagaca atggcagtaa ttttaccagt 2520
actgcagtta aggcagcctg ttggtgggca ggtatccaac aggaatttgg aattccctac 2580
aatcccaaaa gtcagggagt ggtagaatcc atgaataaag aattaaagaa aataatagga 2640
caagtaagag atcaagctga gcaccttaag acagcagtag aatggcagt attcattcac 2700
aattttaaaa gaaaaggggg aattgggggg tacagtgcag gggaaagaat aatagacata 2760
atagcaacag acatacaaac taaagaatta caaaaacaaa ttataagaat tcaaaatttt 2820
cgggtttatt acagagacag cagagaccct atttggaag gaccagccga actactctgg 2880
aaaggtgaag gggtagtagt aatagaagat aaaggtgaca taaaggtagt accaaggagg 2940
aaagcaaaaa tcattagaga ttatggaaaa cagatggcag gtgctgattg tgtggcaggt 3000
ggacaggatg aagat                                     3015
```

<210> 64
<211> 297
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C
Protease Optimized

<400> 64
ccccagatca ccctgtggca gcgccccctg gtgagcatca aggtggaggg ccagatcaag 60
gaggccctgc tggacaccgg cgccgacgac accgtgctgg aggagatcga cctgcccggc 120
aagtggaagc ccaagatgat cggcggcatc ggcggttca tcaaggtgcg ccagtacgac 180
cagatcctga tcgagatctg cggcaagaag gccatcggca ccgtgctggt gggccccacc 240
cccgtgaaca tcacggccg caacctgctg acccagctgg gctgcaccct gaacttc 297

<210> 65
<211> 297
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C
Protease Wild Type

<400> 65
cctcaaata ctctttggca gcgaccctt gtctcaataa aagtagaggg ccagataaag 60
gaggctctct tagacacagg agcagatgat acagtattag aagaaataga ttgcccagg 120
aaatggaac caaaaatgat agggggaatt ggaggtttta tcaaagtaag acagtatgat 180
caaatactta tagaaatttg tggaaaaaag gctataggta cagtattagt agggcctaca 240
ccagtcaaca taattggaag aaatctgtta actcagcttg gatgcacact aaatttt 297

<210> 66
<211> 297
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C
Inactivated Protease Optimized

<400> 66
ccccagatca ccctgtggca gcgccccctg gtgagcatca aggtggaggg ccagatcaag 60
gaggccctgc tggccaccgg cgccgacgac accgtgctgg aggagatcga cctgcccggc 120
aagtggaagc ccaagatgat cggcggcatc ggcggttca tcaaggtgcg ccagtacgac 180
cagatcctga tcgagatctg cggcaagaag gccatcggca ccgtgctggt gggccccacc 240
cccgtgaaca tcacggccg caacctgctg acccagctgg gctgcaccct gaacttc 297

<210> 67
<211> 297
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C
Inactivated Protease Wild Type

<400> 67

```
cctcaaatca ctctttggca ggcacccctt gtctcaataa aagtagaggg ccagataaag 60
gaggctctct tagccacagg agcagatgat acagtattag aagaaataga tttgccaggg 120
aaatggaaac caaaaatgat agggggaatt ggaggtttta tcaaagtaag acagtatgat 180
caaatactta tagaaatttg tggaaaaaag gctataggta cagtattagt agggcctaca 240
ccagtcaaca taattggaag aaatctgtta actcagcttg gatgcacact aaatttt 297
```

<210> 68

<211> 1965

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C
Inactivated Protease Mutated Reverse
Transcriptase Optimized

<400> 68

```
ccccagatca ccctgtggca ggcacccctg gtgagcatca aggtggaggg ccagatcaag 60
gaggccctgc tggccaccgg cgccgacgac accgtgctgg aggagatcga cctgcccggc 120
aagtggaaac ccaagatgat cggcggtatc ggcggttca tcaaggtgcg ccagtacgac 180
cagatcctga tcgagatctg cggcaagaag gccatcggca ccgtgctggt gggccccacc 240
cccgtaaca tcacggccg caacctgctg acccagctgg gctgcaccct gaacttcccc 300
atcagcccca tcgagaccgt gcccgtgaag ctgaagcccg gcatggacgg cccaaggtg 360
aagcagtggc ccctgaccga ggagaagatc aaggccctga ccgccatctg cgaggagatg 420
gagaaggagg gcaagatcac caagatcgcc ccgacaacc cctacaacac ccccggttcc 480
gccatcaaga agaaggacag caccaagtgg cgcaagctgg tggacttccg cgagctgaac 540
aagcgacccc aggacttctg ggaggtgcag ctgggcatcc cccaccccg cggcctgaag 600
aagaagaaga gcgtgaccgt gctggacgtg ggcgacgcct acttcagcgt gccctggac 660
gagagcttcc gcaagtacac cgccttcacc atccccagca tcaacaacga gacccccggc 720
atccgctacc agtacaacgt gctgccccag ggctggaagg gcagccccgc catcttccag 780
agcagcatga ccaagatcct ggagcccttc cgcgccaaga accccgacat cgtgatctac 840
caggcccccc tgtacgtggg cagcgacctg gagatcggcc agcaccgcgc caagatcgag 900
gagctgcgcg agcacctgct gaagtggggc ttcaccaccc ccgacaagaa gcaccagaag 960
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ctgcccagaga aggacagctg gaccgtgaac gacatccaga agctggtggg caagctgaac 1080
tgggccagcc agatctaccc cggcatcaag gtgcgccagc tgtgcaagct gctgcgcggc 1140
gccaaggccc tgaccgacat cgtgcccctg accgaggagg ccgagctgga gctggccgag 1200
aaccgcgaga tcctgcgcga gcccgtgcac ggctgtact acgacccag caaggacctg 1260
atcgccgaga tccagaagca gggccacgag cagtggacct accagatcta ccaggagccc 1320
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aagcagctga ccgaggccgt gcagaagatc gccatggaga gcacgtgat ctggggcaag 1440
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tggcaggcca cctggatccc cgagtgggag ttcgtgaaca cccccccct ggtgaagctg 1560
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accaaccgag aggccaagat cggcaaggcc ggctacgtga ccgaccgagg ccgcccagaag 1680
atcgtgaccc tgaccaacac caccaaccag aagaccgagc tgcaggccat ccagctggcc 1740
ctgcaggaca gcggcagcga ggtgaacatc gtgaccgaca gccagtacgc cctgggcatac 1800
atccaggccc agcccacaa gagcgacagc gagatcttca accagatcat cgagcagctg 1860
atcaacaagg agcgcaccta cctgagctgg gtgcccggcc acaaggcat cggcggcaac 1920
gagcaggtgg acaagctggt gagcaagggc atccgcaagg tgctg 1965
```

<210> 69

<211> 1965

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C
Inactivated Protease Mutated Reverse Transcriptase
Wild Type

<400> 69

```
cctcaaatca ctctttggca ggcacccctt gtctcaataa aagtagaggg ccagataaag 60
gaggtctctt tagccacagg agcagatgat acagtattag aagaaataga tttgccaggg 120
aaatggaaac caaaaatgat agggggaatt ggaggtttta tcaaagtaag acagtatgat 180
caaatactta tagaaatttg tggaaaaaag gctataggtg cagtattagt agggcctaca 240
ccagtcaaca taattggaag aaatctgtta actcagcttg gatgcacact aaattttcca 300
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aaacaatggc cattgacaga agaaaaaata aaagcattaa cagcaatttg tgaggaaatg 420
gagaaggaag gaaaaattac aaaaattggg cctgataatc catataacac tccagtattt 480
gccataaaaa agaaggacag tactaagtgg agaaaattag tagatttcag ggaactcaat 540
aaaagaactc aagacttttg ggaagttcaa ttaggaatac cacacccagc aggattaaaa 600
aagaaaaaat cagtgcagct gctagatgtg ggggatgcat atttttcagt tccttttagat 660
gaaagcttca ggaatatatac tgcattcacc atacctagta taaacaatga aacaccaggg 720
attagatata aatataatgt gctgccacag ggatggaaag gatcaccagc aatattccag 780
agtagcatga caaaaatctt agagcccttc agagcaaaaa atccagacat agttatctat 840
caagccccgt tgtatgtagg atctgactta gaaatagggc aacatagagc aaaaatagaa 900
gagttaaggg aacattttatt gaaatgggga tttacaacac cagacaagaa acatcaaaaa 960
gaacccccat ttcttcccat cgaactccat cctgacaaat ggacagtaca acctatactg 1020
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gccaaagcac taacagacat agtaccacta actgaagaag cagaattaga attggcagag 1200
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ctgcaggatt caggatcaga agtaaacata gtaacagact cacagtatgc attaggaatc 1800
attcaagcac aaccagataa gagtgactca gagatattta accaaataat agaacagtta 1860
ataaacaagg aaagaatcta cctgtcatgg gtaccagcac ataaaggaat tgggggaaat 1920
gaacaagtag ataaattagt aagtaaggga attaggaaag tgttg 1965
```

<210> 70

<211> 1977

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C
Protease and Reverse Transcriptase Optimized

<400> 70

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ccccagatca ccctgtggca ggcacccctg gtgagcatca aggtggaggg ccagatcaag 60
gagggccctgc tggacaccqg cgcgcagcag accgtgctgg agggagatcga cctgcccggc 120
aagtggaaag ccaagatgat cggcggcatc ggcggcttca tcaaggtgag ccagtacgac 180
cagatcctga tcgagatctg cggcaagaag gccatcggca ccgtgctggt gggccccacc 240
cccgtgaaca tcatcgggcg caacctgctg acccagctgg gctgcaccct gaacttcccc 300
atcagcccca tcgagaccgt gcccgtagaag ctgaagcccg gcatggacgg ccccaagggt 360
```

aagcagtggc	ccctgaccga	ggagaagatc	aaggccctga	ccgccatctg	cgaggagatg	420
gagaaggagg	gcaagatcac	caagatcggc	cccgaacaacc	cctacaacac	ccccgtgttc	480
gccatcaaga	agaaggacag	caccaagtgg	cgcaagctgg	tggacttccg	cgagctgaac	540
aagcgcaccc	aggacttctg	ggaggtgcag	ctgggcatcc	cccaccccg	cggcctgaag	600
aagaagaaga	gcgtgaccgt	gctggacgtg	ggcgacgcct	acttcagcgt	gccccctggac	660
gagagcttcc	gcaagtacac	cgcttccacc	atccccagca	tcaacaacga	gacccccggc	720
atccgctacc	agtacaacgt	gctgccccag	ggctggaagg	gcagccccgc	catcttccag	780
agcagcatga	ccaagatcct	ggagcccttc	cgcgccaaga	accccgacat	cgtgatctac	840
cagtacatgg	acgacctgta	cgtgggcagc	gacctggaga	tcggccagca	ccgcgccaag	900
atcgaggagc	tgcgcgagca	cctgctgaag	tggggcttca	ccacccccga	caagaagcac	960
cagaagtgag	cccccttcct	gtggatgggc	tacgagctgc	accccgacaa	gtggaccgtg	1020
cagcccatcc	tgtgcccga	gaaggacagc	tggaccgtga	acgacatcca	gaagctggtg	1080
ggcaagctga	actgggccag	ccagatctac	cccggcatca	aggtgcgcca	gctgtgcaag	1140
ctgctgcgcg	gcgccaaggc	cctgaccgac	atcgtgcccc	tgaccgagga	ggccgagctg	1200
gagctggccg	agaaccgcga	gatcctgcgc	gagcccgtgc	acggcgtgta	ctaccgaccc	1260
agcaaggacc	tgatcgccga	gatccagaag	cagggccacg	agcagtggac	ctaccagatc	1320
taccaggagc	ccttcaagaa	cctgaagacc	ggcaagtacg	ccaagatgcg	caccaccac	1380
accaagcagc	tgaagcagct	gaccgagcc	gtgcagaaga	tcgccatgga	gagcatcgtg	1440
atctggggca	agacccccaa	gttccgcctg	cccatccaga	aggagacctg	ggagacctgg	1500
tggaccgact	actggcaggc	cacctggatc	cccagtgagg	agttcgtgaa	cacccccccc	1560
ctggtgaagc	tgtggtacca	gctggagaag	gaccccatcg	ccggcgtgga	gaccttctac	1620
gtggacggcg	ccaccaaccg	cgaggccaag	atcggcaagg	ccggctacgt	gaccgaccgc	1680
ggccgccaga	agatcgtgac	cctgaccaac	accaccaacc	agaagaccga	gctgcaggcc	1740
atccagctgg	ccctgcagga	cagcggcagc	gaggtgaaca	tcgtgaccga	cagccagtac	1800
gccctgggca	tcattccaggc	ccagcccgcac	aagagcgaca	gcgagatctt	caaccagatc	1860
atcgagcagc	tgatcaacaa	ggagcgcac	tcactgagct	gggtgcccgc	ccacaagggc	1920
atcgggcgca	acgagcaggt	ggacaagctg	gtgagcaagg	gcacccgcaa	ggtgctg	1977

<210> 71

<211> 1977

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C
Protease and Reverse Transcriptase Wild Type

<400> 71

cctcaaatca	ctcttttgga	gcgacccctt	gtctcaataa	aagtagaggg	ccagataaag	60
gaggctctct	tagacacagg	agcagatgat	acagtattag	aagaaataga	tttgccaggg	120
aaatggaaac	caaaaatgat	agggggaatt	ggagggttta	tcaaagtaag	acagtatgat	180
caaatactta	tagaaatttg	tggaaaaaag	gctataggta	cagtattagt	agggcctaca	240
ccagtcaaca	taattggaag	aaatctgtta	actcagcttg	gatgcacact	aaattttcca	300
attagtccta	ttgaaactgt	accagtaaaa	ttaaaaccag	gaatggatgg	cccaaagggtc	360
aaacaatggc	cattgacaga	agaaaaaata	aaagcattaa	cagcaatttg	tgaggaaatg	420
gagaagggaag	gaaaaattac	aaaaattggg	cctgataatc	catataacac	tccagtattt	480
gccataaaaa	agaaggacag	tactaagtgg	agaaaattag	tagatttcag	ggaactcaat	540
aaaagaactc	aagacttttg	ggaagttcaa	ttagggaatac	cacacccagc	aggattaaaa	600
aagaaaaaat	cagtgcagct	gctagatgtg	ggggatgcat	atttttcagt	tccttttagat	660
gaaagcttca	ggaaatatac	tgcattcacc	atacctagta	taaacaatga	aacaccaggg	720
attagatatc	aatataatgt	gctgccacag	ggatggaaag	gatcaccagc	aatattccag	780
agtagcatga	caaaaatcct	agagcccttc	agagcaaaaa	atccagacat	agttatctat	840
caatatatgg	atgacttgta	tgtaggatct	gacttagaaa	tagggcaaca	tagagcaaaa	900
atagaagagt	taagggaaca	tttattgaaa	tggggattta	caacaccaga	caagaacat	960
caaaaagaac	ccccatttct	ttggatgggg	tttgaactcc	atcctgacaa	atggacagta	1020
caacctatac	tgtgccaga	aaaggatagt	tggactgtca	atgatataca	gaagttagt	1080
ggaaaattaa	actgggcaag	tcagattttac	ccagggatta	aagtaaggca	actctgtaaa	1140

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ctcctcaggg gggccaaagc actaacagac atagtaccac taactgaaga agcagaatta 1200
gaattggcag agaacaggga aattttaaga gaaccagtac atggagtata ttatgatcca 1260
tcaaaagact tgatagctga aatacagaaa caggggcatg aacaatggac atatcaaatt 1320
tatcaagaac catttaaaaa tctgaaaaa ggaagtatg caaaaatgag gactaccac 1380
actaatgatg taaaacagtt aacagaggca gtgcaaaaaa tagccatgga aagcatagta 1440
atatggggaa agactcctaa atttagacta cccatccaaa aagaaacatg ggagacatgg 1500
tggaacagact attggcaagc cacctggatc cctgagtggg agtttgtaa taccctccc 1560
ctagtaaaat tatggtacca actagaaaaa gatcccatag caggagtaga aactttctat 1620
gtagatggag caactaatag ggaagctaaa ataggaaaag cagggtatgt tactgacaga 1680
ggaaggcaga aaattgttac tctaactaac acaacaaatc agaagactga gttacaagca 1740
attcagctag ctctgcagga ttcaggatca gaagtaaaca tagtaacaga ctacacgtat 1800
gcattaggaa tcattcaagc acaaccagat aagagtgact cagagatatt taaccaaata 1860
atagaacagt taataaacia ggaagaatc tacctgtcat ggggtaccagc acataaagga 1920
attgggggaa atgaacaagt agataaatta gtaagtaagg gaattaggaa agtggtg 1977

```

<210> 72

<211> 75

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C
RevExon1 Optimized

<400> 72

```

atggccggcc gcagcggcga cagcgacgag gccctgctgc aggtggtgaa gatcatcaag 60
atcctgtacc agagc 75

```

<210> 73

<211> 76

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C
RevExon1 Wild Type

<400> 73

```

atggcaggaa gaagcggaga cagcgacgaa gcgctcctcc aagtgggtgaa gatcatcaaa 60
atcctctatc aaagca 76

```

<210> 74

<211> 246

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C
RevExon2 Optimized

<400> 74

```

ccctacccca agcccgaggg caccgccag gcccgccga accgcgcgcg ccgctggcgc 60
gcccgccagc gccgatcca caccatcggc gacgcgatcc tgggtggcctg cctggggcgc 120
agcgccgagc ccgtgcccc gcagctgccc cccctggagc gcctgcacat caactgcagc 180
gagggcagcg gcaccagcgg caccagcag agccagggca ccaccgaggg cgtggggcgc 240
ccctaa 246

```


<210> 75
 <211> 248
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: HIV Type C
 RevExon2 Wild Type

<400> 75
 acccttacc caagcccgag gggactcgac aggctcggag gaatcgaaga agaaggtgga 60
 gagcaagaca gagacagatc catabgattg gtgagcggat tcttgctcgt tgcctgggac 120
 gatctgcgga gcctgtgcct cttcagctac caccgcttga gagacttcat attaattgca 180
 gtgagggcag tggaaattct gggacacagc agtctcaggg gactacagag ggggtgggag 240
 atccttaa 248

<210> 76
 <211> 1680
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: HIV Type C
 Reverse Transcriptase Optimized

<400> 76
 cccatcagcc ccacgcagac cgtgcccgtg aagctgaagc ccggcatgga cggccccaag 60
 gtgaagcagt ggcccctgac cgaggagaag atcaaggccc tgaccgccat ctgcgaggag 120
 atggagaagg agggcaagat caccaagatc ggcccgcaca acccctacaa ccccccggtg 180
 ttcgccatca agaagaagga cagcaccaag tggcgcaagc tgggtggactt ccgcgagctg 240
 aacaagcgca ccagagactt ctgggaggtg cagctgggca tccccacccc cgccggcctg 300
 agaagaaga agagcgtgac cgtgctggac gtgggcgacg cctacttcag cgtgcccctg 360
 gacgagagct tccgcaagta caccgccttc accatcccca gcatcaacaa cgagaccccc 420
 ggcatccgct accagtacaa cgtgctgccc cagggtgga agggcagccc cgccatcttc 480
 cagagcagca tgaccaagat cctggagccc ttccgcgcca agaaccgga catcgtgatc 540
 taccagtaca tggacgacct gtacgtgggc agcgacctgg agatcggccca gcaccgcgcc 600
 aagatcgagg agctgcgcga gcacctgctg aagtggggct tcaccacccc cgacaagaag 660
 caccagaagg agccccctt cctgtggatg ggctacgagc tgcaccccga caagtggacc 720
 gtgcagccca tctgtctgcc cgagaaggac agctggaccg tgaacgacat ccagaagctg 780
 gtgggcaagc tgaactgggc cagccagatc taccgagga tcaaggtgag ccagctgtgc 840
 aagctgctgc gcggcgccaa ggccctgacc gacatcgtgc ccctgaccga ggaggccgag 900
 ctggagctgg ccgagaaccg cgagatcctg cgcgagcccg tgcacggcgt gtactacgac 960
 cccagcaagg acctgatcgc cgagatccag aagcagggcc acgagcagtg gacctaccag 1020
 atctaccagg agcccttcaa gaacctgaag accggcaagt acgccaagat gcgcaccacc 1080
 cacaccaacg acgtgaagca gctgaccgag gccgtgcaga agatcgccat ggagagcatc 1140
 gtgatctggg gcaagacccc caagtccgc ctgcccatcc agaaggagac ctgggagacc 1200
 tgggtggaccg actactggca ggccacctgg atccccgagt gggagtctgt gaacaccccc 1260
 cccctggtga agctgtggta ccagctggag aaggacccca tcgccggcgt ggagaccttc 1320
 tacgtggacg gcgccaccaa ccgagggcc aagatcggca aggccggcta cgtgaccgac 1380
 cgcggccgcc agaagatcgt gacctgacc aacaccacca accagaagac cgagctgcag 1440
 gccatccagc tggccctgca ggacagcggc agcgaggtga acatcgtgac cgacagccag 1500
 tacgccctgg gcatcatcca ggcccagccc gacaagagcg acagcgagat cttcaaccag 1560
 atcatcgagc agctgatcaa caaggagcgc atctacctga gctgggtgcc cgcccacaag 1620
 ggcacgagcg gcaacgagca ggtggacaag ctggtgagca agggcatccg caaggtgctg 1680

<210> 77
 <211> 1680

<212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: HIV Type C
 Reverse Transcriptase Wild Type

<400> 77
 ccaattagtc ctattgaaac tgtaccagta aaattaaaac caggaatgga tggcccaaag 60
 gtcaaacat ggccattgac agaagaaaaa ataaaagcat taacagcaat ttgtgaggaa 120
 atggagaagg aaggaaaaat tacaaaaatt gggcctgata atccatataa cactccagta 180
 tttgccataa aaaagaagga cagtactaag tggagaaaat tagtagattt cagggaaactc 240
 aataaaagaa ctcaagactt ttgggaagtt caattaggaa taccacaccc agcaggatta 300
 aaaaagaaaa aatcagtgac agtgctagat gtgggggatg catatttttc agttccttta 360
 gatgaaagct tcaggaaata tactgcattc accataccta gtataaaca tgaaacacca 420
 gggattagat atcaatataa tgtgctgcca cagggatgga aaggatcacc agcaatattc 480
 cagagtagca tgacaaaaat cttagagccc ttcagagcaa aaaatccaga catagtattc 540
 tatcaatata tggtagactt gtatgtagga tctgacttag aaatagggca acatagagca 600
 aaaatagaag agttaaggga acattttattg aaatggggat ttacaacacc agacaagaaa 660
 catcaaaaag aacccccatt tctttggatg gggatgaac tccatcctga caaatggaca 720
 gtacaaccta tactgctgcc agaaaaggat agttggactg tcaatgatat acagaagtta 780
 gtgggaaaaa taaactgggc aagtcagatt taccagggga ttaaagtaag gcaactctgt 840
 aaactcctca ggggggcca agcactaaca gacatagtac cactaactga agaagcagaa 900
 ttagaattgg cagagaacag ggaatttta agagaaccag tacatggagt atattatgat 960
 ccatcaaaag acttgatagc tgaatacag aaacaggggc atgaacaatg gacatatcaa 1020
 atttatcaag aaccatttaa aaatctgaaa acagggaagt atgcaaaaat gaggactacc 1080
 cacactaatg atgtaaaaca gttaacagag gcagtgcaaa aaatagccat ggaaagcata 1140
 gtaatatggg gaaagactcc taaatttaga ctacccatcc aaaaagaaac atgggagaca 1200
 tgggtggacag actattggca agccacctgg atccctgagt gggagtgtgt taataccct 1260
 cccctagtaa aattatggta ccaactagaa aaagatccca tagcaggagt agaaactttc 1320
 tatgtagatg gagcaactaa tagggaagct aaaataggaa aagcagggtta tgttactgac 1380
 agaggaaggc agaaaattgt tactctaact aacacaacaa atcagaagac tgagttacaa 1440
 gcaattcagc tagctctgga ggattcagga tcagaagtaa acatagtaac agactcacag 1500
 tatgcattag gaatcattca agcacaacca gataagagt actcagagat atttaacca 1560
 ataatagaac agttaataaa caaggaaaga atctacctgt catgggtacc agcacataaa 1620
 ggaattgggg gaaatgaaca agtagataaa ttagtaagta agggaattag gaaagtgttg 1680

<210> 78
 <211> 1668
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: HIV Type C
 Mutated Reverse Transcriptase Optimized

<400> 78
 cccatcagcc ccatcgagac cgtgcccgtg aagctgaagc ccggcatgga cggccccaag 60
 gtgaagcagt ggcccctgac cgaggagaag atcaaggccc tgaccgccat ctgagaggag 120
 atggagaagg agggcaagat caccaagatc ggcccgcaca acccctacaa ccccccggtg 180
 ttcgccatca agaagaagga cagcaccaag tggcgcaagc tgggtggactt ccgagagctg 240
 aacaagcgca ccaggactt ctgggaggtg cagctgggca tccccaccc cgccggcctg 300
 aagaagaaga agagcgtgac cgtgctggac gtgggcgacg cctacttcag cgtgcccctg 360
 gacgagagct tccgcaagta caccgccttc accatccca gcatcaaca cgagaccccc 420
 ggcattccgt accagtacaa cgtgctgccc cagggtgga agggcagccc cgccatcttc 480
 cagagcagca tgaccaagat cctggagccc ttccgcgcca agaaccgccga catcgtgatc 540
 taccaggccc ccctgtacgt gggcagcgac ctggagatcg gccagcaccg cgccaagatc 600

gaggagctgc	gcgagcacct	gctgaagtgg	ggcttcacca	cccccgacaa	gaagcaccag	660
aaggagcccc	ccttcctgcc	catcgagctg	cacccccgaca	agtggaccgt	gcagcccatc	720
ctgctgcccc	agaaggacag	ctggaccgtg	aacgacatcc	agaagctggg	gggcaagctg	780
aactggggcca	gccagatcta	ccccggcatc	aaggtgcgcc	agctgtgcaa	gctgctgccc	840
ggcgccaagg	ccctgaccga	catcgtgccc	ctgaccgagg	aggccgagct	ggagctggcc	900
gagaaccgcg	agatcctgcg	cgagcccgtg	cacggcgtgt	actacgaccc	cagcaaggac	960
ctgatcgccg	agatccagaa	gcagggccac	gagcagtggg	cctaccagat	ctaccaggag	1020
cccttcaaga	acctgaagac	cggcaagtac	gccaagatgc	gcaccaccca	caccaacgac	1080
gtgaagcagc	tgaccgaggc	cgtgcagaag	atcgccatgg	agagcatcgt	gatctggggc	1140
aagaccccca	agttccgcct	gcccattccag	aaggagacct	gggagacctg	gtggaccgac	1200
tactggcagg	ccacctggat	ccccgagtgg	gagttcgtga	acaccccccc	cctggtgaag	1260
ctgtgttacc	agctggagaa	ggaccccatc	gccggcgtgg	agaccttcta	cgtggacggc	1320
gccaccaacc	gcgaggccaa	gateggcaag	gccggctacg	tgaccgaccg	cggccgcccag	1380
aagatcgtga	ccctgacca	caccaccaac	cagaagaccg	agctgcaggc	catccagctg	1440
gccctgcagg	acagcggcag	cgaggtgaac	atcgtgaccg	acagccagta	cggcctgggc	1500
atcatccagg	cccagcccga	caagagcgac	agcgagatct	tcaaccagat	catcgagcag	1560
ctgatcaaca	aggagcgcac	ctacctgagc	tgggtgcccg	cccacaaggg	catcggcggc	1620
aacgagcagg	tggacaagct	ggtgagcaag	ggcatccgca	aggtgctg		1668

<210> 79

<211> 1668

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C
Mutated Reverse Transcriptase Wild Type

<400> 79

ccaattagtc	ctattgaaac	tgtaccagta	aaattaaaac	caggaatgga	tggcccaaaag	60
gtcaaacaat	ggccattgac	agaagaaaaa	ataaaagcat	taacagcaat	ttgtgaggaa	120
atggagaagg	aaggaaaaat	tacaaaaatt	gggcctgata	atccatataa	cactccagta	180
tttgccataa	aaaagaagga	cagtactaag	tggagaaaat	tagtagattt	cagggaaactc	240
aataaaaaga	ttcaagactt	ttgggaagtt	caattaggaa	taccacaccc	agcaggatta	300
aaaaagaaaa	aatcagtgc	agtgtagat	gtgggggatg	catatttttc	agttcccttta	360
gatgaaagct	tcaggaaata	tactgcattc	accataccta	gtataaacia	tgaaacacca	420
gggattagat	atcaatataa	tgtgtgccca	cagggatgga	aaggatcacc	agcaatattc	480
cagagtagca	tgacaaaaat	cttagagccc	ttcagagcaa	aaaatccaga	catagtattc	540
tatcaagccc	cgttgtatgt	aggatctgac	ttagaaatag	ggcaacatag	agcaaaaaata	600
gaagagttaa	gggaacattt	attgaaatgg	ggatttcaaa	caccagacaa	gaaacatcaa	660
aaagaacccc	catttcttcc	catcgaactc	catcctgaca	aatggacagt	acaacctata	720
ctgctgccag	aaaaggatag	ttggactgtc	aatgatatac	agaagttagt	gggaaaatta	780
aactgggcaa	gtcagattta	cccagggatt	aaagtaaggc	aactctgtaa	actcctcagg	840
ggggccaaag	cactaacaga	catagtacca	ctaactgaag	aagcagaatt	agaattggca	900
gagaacaggg	aaatttttaag	agaaccagta	catggagtat	attatgatcc	atcaaaaagac	960
ttgatagctg	aaatacagaa	acagggggcat	gaacaatgga	catatcaaat	ttatcaagaa	1020
ccatttaaaa	atctgaaaac	agggaagtat	gcaaaaatga	ggactaccca	cactaatgat	1080
gtaaaaacagt	taacagaggg	agtgcacaaa	atagccatgg	aaagcatagt	aatatgggga	1140
aagactccta	aatttagact	acccatccaa	aaagaaacat	gggagacatg	gtggacagac	1200
tattggcaag	ccacctggat	ccctgagtgg	gagtttgtaa	ataccctcc	cctagtataa	1260
ttatggtacc	aactagaaaa	agatcccata	gcaggagtag	aaactttcta	tgtagatgga	1320
gcaactaata	gggaagctaa	aataggaaaa	gcagggtatg	ttactgacag	aggaaggcag	1380
aaaattgtta	ctctaactaa	cacaacaaat	cagaagactg	agttacaagc	aattcagcta	1440
gctctgcagg	attcaggatc	agaagtaaac	atagtaacag	actcacagta	tgcattagga	1500
atcattcaag	cacaaccaga	taagagtgc	tcagagatat	ttaacaaaat	aatagaacag	1560
ttaataaaca	aggaaagaat	ctacctgtca	tgggtaccag	cacataaagg	aattggggga	1620
aatgaacaag	tagataaatt	agtaagtaag	ggaattagga	aagtgttg		1668

<210> 80
<211> 216
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C
TatC22Exon1 Optimized

<400> 80
atggagcccg tggaccccaa gctgaagccc tggaaccacc ccggcagcca gcccaagacc 60
gccggcaaca actgcttctg caagcactgc agctaccact gcctggtgtg cttccagacc 120
aagggcctgg gcatcagcta cggccgcaag aagcggcgcc agcggcgag cgcccccccc 180
agcggcgagg accaccagaa cccctgagc aagcag 216

<210> 81
<211> 216
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C
TatExon1 Optimized

<400> 81
atggagcccg tggaccccaa gctgaagccc tggaaccacc ccggcagcca gcccaagacc 60
gcctgcaaca actgcttctg caagcactgc agctaccact gcctggtgtg cttccagacc 120
aagggcctgg gcatcagcta cggccgcaag aagcggcgcc agcggcgag cgcccccccc 180
agcggcgagg accaccagaa cccctgagc aagcag 216

<210> 82
<211> 216
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C
TatExon1 Wild Type

<400> 82
atggagccag tagatcctaa actaaagccc tggaaccatc caggaagcca acctaaaaca 60
gcttgtaata attgcttttg caaacactgt agctatcatt gtctagtttg ctttcagaca 120
aaaggtttag gcatttccta tggcaggaag aagcggagac agcgacgaag cgctcctcca 180
agtgtgtaag atcatcaaaa tcctctatca aagcag 216

<210> 83
<211> 93
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C
TatExon2 Optimized

<400> 83
cccttgcccc agggccgcgg cgacagcacc ggcagcgagg agagcaagaa gaaggtggag 60

agcaagaccg agaccgaccc ctacgactgg tga 93
 <210> 84
 <211> 93
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: HIV Type C
 TatExon2 Wild Type

<400> 84
 cccttaccctc aagcccagagg ggactcgaca ggctcggagg aatcgaagaa gaaggtggag 60
 agcaagacag agacagatcc atacgattgg tga 93

<210> 85
 <211> 579
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: HIV Type C
 Vif Optimized

<400> 85
 atggagaacc gctggcaggt gctgatcgtg tggcaggtgg accgcatgaa gatccgcgcc 60
 tggaaacagcc tggatgaagca ccacatgtac atcagccgcc gcgccagcgg ctgggtgtac 120
 cgccaccact tcgagagccg ccaccccaag gtgagcagcg aggtgcacat cccctgggc 180
 gacgcccgcc tggatgatcaa gacctactgg ggcctgcaga ccggcgagcg cgactggcac 240
 ctggggccacg gcgtgagcat cgagtggcgc ctgcgcgagt acagcaccca ggtggacccc 300
 gacctggccg accagctgat ccacatgcac tacttcgact gcttcaccga gagcgccatc 360
 cgccaggcca tcctgggcca catcgtgttc cccgcgtgcg actaccaggc cggccacaag 420
 aaggtgggca gcctgcagta cctggccctg accgccctga tcaagcccaa gaagcgcaag 480
 cccccctgc ccagcgtgcg caagctgggtg gaggaccgct ggaacgaccc ccagaagacc 540
 cgcgcccgcc gcggcaacca caccatgaac ggccactag 579

<210> 86
 <211> 579
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: HIV Type C
 Vif Wild Type

<400> 86
 atggaaaaca gatggcaggt gctgattgtg tggcaggtgg acaggatgaa gattagagca 60
 tggaatagtt tagtaaagca ccatatgtat atatcaagga gagctagtgg atgggtctac 120
 agacatcatt ttgaaagcag acatccaaaa gtaagtccag aagtacatat cccattaggg 180
 gatgctagat tagtaataaa aacatattgg ggtttgcaga caggagaaaag agattggcat 240
 ttgggtcatg gagtctccat agaatggaga ctgagagaat acagcacaca agtagaccct 300
 gacctggcag accagctaata tcacatgcat tattttgatt gttttacaga atctgccata 360
 agacaagcca tattaggaca catagttttt cctagggtgtg actatcaagc aggacataag 420
 aaggtaggat ctctgcaata cttggcactg acagcattga taaaaccaa aaagagaaag 480
 ccacctctgc ctagtgttag aaaattagta gaggatagat ggaacgaccc ccagaagacc 540
 aggggccgca gaggaacca tacaatgaat ggacactag 579

<210> 87

<211> 288
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C
Vpr Optimized

<400> 87

```
atggagcgcc ccccgagga ccagggcccc cagcgcgagc cctacaacga gtggaccctg 60
gagatcctgg aggagctgaa gcaggaggcc gtgcgccact tccccgccc ctggctgcac 120
agcctgggccc agtacatcta cgagacctac ggcgacacct ggaccggcgt ggaggccatc 180
atccgcgtgc tgcagcagct gctgttcac cacttccgca tcggctgcca gcacagccgc 240
atcgccatcc tgcgccagcg ccgcgcccgc aacggcgcca gccgcagc 288
```

<210> 88
<211> 288
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C
Vpr Wild Type

<400> 88

```
atggaacgac cccagaaga ccagggggccg cagaggggaa catacaatga atggacacta 60
gagattctag aagaactcaa gcaggaagct gtcagacact ttcctagacc atggctccat 120
agcttaggac aatatatcta tgaaacctat ggggatactt ggacgggagt tgaagctata 180
ataagagtac tgcaacaact actgttcatt catttcagaa ttggatgcca acatagcaga 240
ataggcatct tgcgacagag aagagcaaga aatggagcca gtagatcc 288
```

<210> 89
<211> 267
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C
Vpu Optimized

<400> 89

```
atgggtgagcc tgagcctgtt caagggcggtg gactaccgcc tgggcgtggg cgccctgac 60
gtggccctga tcatcgccat catcggtgtg accatcgctt acatcgagta ccgcaagctg 120
gtgcgccaga agaagatcga ctggctgac aagcgcatcc gcgagcgcg caggacagc 180
ggcaacgaga gcgacggcga caccgaggag ctgagcacca tggtaggacat gggccacctg 240
cgctgtgtg acgccaacga cctgtaa 267
```

<210> 90
<211> 267
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: HIV Type C
Vpu Wild Type

<400> 90

```

atggtaagtt taagtttatt taaaggagta gattatagat taggagtagg agcattgata 60
gtagcactaa tcatagcaat aatagtgtgg accatagcat atatagaata taggaaattg 120
gtaagacaaa agaaaataga ctgggttaatt aaaagaatta gggaaagagc agaagacagt 180
ggcaatgaga gtgatgggga cacagaagaa ttgtcaacaa tggtaggatat ggggcatctt 240
aggcttctgg atgctaataa tttgttaa 267

```

```

<210> 91
<211> 321
<212> DNA
<213> Artificial Sequence

```

```

<220>
<223> Description of Artificial Sequence: HIV Type C
RevExon 1 and 2 Optimized

```

```

<400> 91
atggcgggcc gcagcggcga cagcgacgag gccctgctgc aggtggtgaa gatcatcaag 60
atcctgtacc agagccccta ccccaagccc gagggcaccg gccaggcccg ccgcaaccgc 120
cgccgcgctt ggcgcgcccg ccagcgccag atccacacca tcggcgagcg catcctggtg 180
gcctgcctgg gccgcagcgc cgagcccggt cccctgcagc tgccccccct ggagcgcttg 240
cacatcaact gcagcgaggg cagcgccacc agcgccacc agcagagcca gggcaccacc 300
gagggcggtg gcgacccta a 321

```

```

<210> 92
<211> 324
<212> DNA
<213> Artificial Sequence

```

```

<220>
<223> Description of Artificial Sequence: HIV Type C
RevExon 1 and 2 Wild Type

```

```

<400> 92
atggcaggaa gaagcggaga cagcgacgaa gcgctcctcc aagtggtgaa gatcatcaaa 60
atcctctatc aaagcaacc ttacccaag cccgagggga ctgcacaggc tcggaggaaat 120
cgaagaagaa ggtggagagc aagacagaga cagatccata cgattggtga gcggattctt 180
gtcgcttgcc tgggacgatc tgcggagcct gtgcctcttc agctaccacc gcttgagaga 240
cttcatatta attgcagtga gggcagtgga acttctggga cacagcagtc tcaggggact 300
acagaggggg tgggagatcc ttaa 324

```

```

<210> 93
<211> 309
<212> DNA
<213> Artificial Sequence

```

```

<220>
<223> Description of Artificial Sequence: HIV Type C
TatC22 Exon 1 and 2 Optimized

```

```

<400> 93
atggagcccg tggaccccaa gctgaagccc tggaaaccacc ccggcagcca gccaagacc 60
gccggcaaca actgcttctg caagcactgc agctaccact gcctggtgtg cttccagacc 120
aagggccttg gcatcagcta cggccgcaag aagcgccgcc agcggcgag ccccccccc 180
agcggcgagg accaccagaa cccctgagc aagcagcccc tgccccaggc ccgcggcgac 240
agcaccggga gcgaggagag caagaagaag gtggagagca agaccgagac cgaccctac 300
gactggtga 309

```

<210> 94
 <211> 309
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: HIV Type C
 Tat Exon 1 and 2 Optimized

<400> 94
 atggagcccg tggaccccaa gctgaagccc tggaaccacc ccggcagcca gcccagacc 60
 gcctgcaaca actgcttctg caagcactgc agctaccact gcctggtgtg cttccagacc 120
 aagggcctgg gcatcagcta cgcccgcaag aagcgccgcc agcgccgag cgccccccc 180
 agcggcgagg accaccagaa cccctgagc aagcagcccc tgccccaggc ccgcggcgac 240
 agcaccggca gcgaggagag caagaagaag gtggagagca agaccgagac cgaccctac 300
 gactggtga 309

<210> 95
 <211> 309
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: HIV Type C
 Tat Exon 1 and 2 Wild Type

<400> 95
 atggagccag tagatcctaa actaaagccc tggaaccatc caggaagcca acctaaaaca 60
 gcttgtaata attgcttttg caaacactgt agctatcatt gtctagtttg ctttcagaca 120
 aaagggttag gcatttccta tggcaggaag aagcggagac agcgacgaag cgctcctcca 180
 agtgggtgaag atcatcaaaa tcctctatca aagcagccct taccccaagc ccgaggggac 240
 tcgacaggct cggaggaatc gaagaagaag gtggagagca agacagagac agatccatac 300
 gattggtga 309

<210> 96
 <211> 624
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: HIV Type C
 NefD125g Optimized Myristalization Modification

<400> 96
 atggccggca agtggagcaa gcgcagcatc gtgggctggc ccgccgtgcg cgagcgcatg 60
 cgccgcaccg agcccgccgc cgagggcggtg ggcgcgcgcca gccaggacct ggaccgccac 120
 ggcgccctga ccagcagcaa ccccccgcc accaacgagg cctgcgcctg gctgcaggcc 180
 caggaggagg acggcgacgt gggcttcccc gtgcgcccc aggtgcccct gcgccccatg 240
 acctacaaga gcgcctgga cctgagcttc ttctgaagg agaaggcgcg cctggagggc 300
 ctgatctaca gccgaagcg ccaggagatc ctggacctgt ggggtgtaca caccagggc 360
 ttcttccccg gctggcagaa ctacaccagc ggccccggcg tgcgcttccc cctgaccttc 420
 ggctggtgct tcaagctggt gcccgtggac ccccgcgagg tgaaggaggc caacgagggc 480
 gaggacaact gcctgtgca ccccatgagc cagcacggcg ccgaggacga ggaccgcgaq 540
 gtgctgaagt ggaagtcca cagcctgctg gcccaccgcc acatggcccc cgagctgcac 600
 cccgagtact acaaggactg ctga 624

<210> 97

<211> 2565
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Envgp160_TV2_C_ZAopt

<400> 97

```

atgcgcgccc ggggcatcct gaagaactac cgccactggt ggatctgggg catcctgggc 60
ttctggatgc tgatgatgtg caacgtgaag ggcctgtggg tgaccgtgta ctacggcgtg 120
cccgtggggc gcgaggccaa gaccaccctg ttctgcgcca gcgacgcaa ggcctacgag 180
aaggaggtgc acaacgtgtg ggccaccac gcctgctgtg ccaccgaccc caacccccag 240
gaggtgatcc tgggcaacgt gaccgagaac ttcaacatgt ggaagaacga catggtggac 300
cagatgcagg aggacatcat cagcctgtgg gaccagagcc tgaagccctg cgtgaagctg 360
acccccctgt gcgtgaccct gaactgcacc aacgccaccg tgaactacaa caacaccagc 420
aaggacatga agaactgcag cttctacgtg accaccgagc tgcgcgacaa gaagaagaag 480
gagaacgccc tgttctaccg cctggacatc gtgcccctga acaaccgcaa gaacggcaac 540
atcaacaact accgctgat caactgcaac accagcgcca tcaccagggc ctgcccgaag 600
gtgagcttcg accccatccc catccactac tgcgcccccg ccggctacgc cccctgaag 660
tgcaacaaca agaagttcaa cggcacggc ccctgcgaca acgtgagcac cgtgcagtgc 720
accacgggca tcaagcccgt ggtgagcacc cagctgctgc tgaacggcag cctggccgag 780
gaggagatca tcatccgcag cgagaacctg accaacaacg tgaagaccat catcgtgcac 840
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cgcacgggcc ccggccaggc cttctacgcc accggcgaca tcatcgggca catccgccag 960
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aacaccgagc gcatcacctt gcagtgccgc atcaagcaga tcatcaacat gtggcaggag 1260
gtgggcccgc ccatgtaccg cccccccatc gccggcaaca tcacctgccg cagcaacatc 1320
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gagatcaagc ccctgggctg ggccccacc gccgcgtggg ggagcgcgag 1500
aagcgcgccg tgggcctggg gcgcgtgttc ctgggcttcc tgggcgcgcg cggcagcacc 1560
atgggcgcgc ccagcatcac cctgaccgtg caggcccgcc agctgctgag cggcatcgtg 1620
cagcagcaga gcaacctgct gcgcgccatc gaggcccgag agcacaatgct gcagctgacc 1680
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cagagccagc aggagcgcaa cgagaaggac ctgctggccc tggaccgctg gaacaacctg 1980
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ctgcgcggcc tgcagcgcg ctggggcacc ctgaagtacc tgggcagcct ggtgcagtac 2400
tggggcctgg agctgaagaa gagcgccatc aacctgctgg acaccatcgc catcgccgtg 2460
gccgagggca ccgaccgcat cctggagtte atccagaacc tgtgccgcgg catccgcaac 2520
gtgccccgcc gcatccgcca gggcttcgag gccgcctgc agtaa 2565

```

<210> 98
 <211> 2565
 <212> DNA
 <213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Envgp160_TV2_C_ZAwT

<400> 98

```
atgagagcga ggggggatact gaagaattat cgacactggt ggatatgggg catcttaggc 60
ttttggatgc taatgatgtg taatgtgaag ggcttgtggg tcacagtcta ctacggggta 120
cctgtgggga gagaagcaaa aactactcta ttttgtgcat cagatgctaa agcatatgag 180
aaagaagtgc ataagtctct ggctacacat gcctgtgtac ccacagaccc caacccacaa 240
gaagtgattt tgggcaatgt aacagaaaat tttaacatgt ggaaaaatga catggtggat 300
cagatgcagg aagatataat cagtttatgg gatcaaagcc ttaagccatg tgtaaaattg 360
acccactctt gtgtcacttt aaactgtaca aatgcaactg ttaactacaa taatacctct 420
aaagacatga aaaattgctc tttctatgta accacagaat taagagataa gaaaaagaaa 480
gaaaatgcac ttttttatag acttgatata gtaccactta ataataggaa gaatgggaat 540
attacaact atagattaat aaattgtaat acctcagcca taacacaagc ctgtccaaaa 600
gtctcgtttg acccaattcc tatacattat tgtgctccag ctggttatgc gcctctaaaa 660
tgtaataata agaaattcaa tggaaatagga ccatgcgata atgtcagcac agtacaatgt 720
acacatggaa ttaagccagt ggtatcaact caattactgt taaatggtag cctagcagaa 780
gaagagataa taattagatc tgaataatctg acaaaacaat tcaaaacaat aatagtacat 840
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ttacaagaac tcttccctaa tagtacaggg ataaaatttg caccacactc aggagggggac 1080
ctagaaatta ctacacatag ctttaattgt ggaggagaat ttttctattg caatacaaca 1140
gacctgttta atagtacata cagtaatggg acatgcacta atggtacatg catgtctaata 1200
aatcacagag ccatcacact ccaatgcaga ataaaacaaa ttataaacat gtggcaggag 1260
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caacagcaaa gtaatttgct gagggtata gaggcgcaac agcatatgtt gcaactcacg 1680
gtctggggca ttaagcagct ccaggcaaga gtcttggtta tagagagata cctacaggat 1740
caacagctcc taggactgtg gggctgctct ggaaaactca tctgcaccac taatgtgctt 1800
tggaactcta gttggagtaa taaaactcaa agtgatattt gggataacat gacctggatg 1860
cagtgggata gggaaattag taattacaca aacacaatat acaggttgct tgaagactcg 1920
caaagccagc aggaaagaaa tgaaaaagat ttactagcat tggacagggt gaacaatctg 1980
tggaattggg ttagcataac aaattggctg tggatatata aaatattcat aatgatagta 2040
ggaggcttga taggtttaag aataattttt gctgtgctct ctctagtaaa tagagttagg 2100
cagggatact cacccttgct attgcagacc cttatcccaa acccgagggg acccgacagg 2160
ctcggaggaa tcgaagaaga aggtggagag caagacagca gcagatccat tcgattagt 2220
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cgattgagag acttcatatt aattgtagtg agagcagtgg aacttctggg acacagtagt 2340
ctcaggggac tgagaggggg gtggggaacc cttaagtatt tggggagtct tgtgcaatat 2400
tgggggtctag agttaaaaaa gagtgtctatt aatctgcttg atactatagc aatagcagta 2460
gctgaaggaa cagataggat tctagaattc atacaaaacc tttgtagagg tatccgcaac 2520
gtacctagaa gaataagaca gggcttcgaa gcagctttgc aataa 2565
```

<210> 99

<211> 1491

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Gag_TV2_C_ZAopt

<400> 99

```

atgggcgccc ggcgcagcat cctgcgcggc ggcaagctgg acaagtggga gaagatccgc 60
ctgcgccccg gcgcccgcaa gcactacatg ctgaagcacc tgggtgtgggc cagccgcgag 120
ctggagcgct tcgcctgtgaa ccccgccctg ctggagacca gcgacggctg ccgccagatc 180
atcaagcagc tgcagcccg cctgcagacc ggcaaccgag agatccgcag cctgttcaac 240
accgtggcca ccctgtactg cgtgcacaag ggcatcgacg tgcgcgacac caaggaggcc 300
ctggacaaga tcgaggagga gcagaacaag tgccagcaga agaccagca ggccgaggcc 360
gccgacaaga aggtgagcca gaactacccc atcgtgcaga acctgcaggg ccagatggtg 420
caccaggcca tcagccccc caccctgaac gcctgggtga aggtgatcga ggagaaggcc 480
ttcagccccg aggtgatccc catgttcacc gccctgagcg agggcgccac ccccaggac 540
ctgaacacca tgctgaacac cgtgggcggc caccaggccg ccatgcagat gctgaaggac 600
accatcaacg aggagggcgc cgagtgggac cccctgcacc ccgtgcacgc cggccccgtg 660
gcccccgccc agatgcgcga gcccccgccc agcgacatcg ccggcaccac cagcaccctg 720
caggagcaga tcgcctggat gaccagcaac ccccccatcc ccgtgggcga catctacaag 780
cgctggatca tcctgggccc gaacaagatc gtgcgcatgt acagccccgt gagcatcctg 840
gacatcaagc agggcccaa ggagcccttc cgcgactacg tggaccgctt cttcaagacc 900
ctgcgcgccc agcagagcac ccaggaggtg aagaactgga tgaccgacac cctgctggtg 960
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tgccgcgccc cccgcaagcg cggctgctgg aagtgcggca agggggcca ccagatgaag 1260
gactgcaccg agcgccaggc caacttcctg ggcaagatct ggccagcca caagggccgc 1320
cccggcaact tcctgcagag ccgccccgag cccaccgccc cccccctgga gccaccgccc 1380
cccccgccc agagcttcaa gttcaaggag accccaagc aggagcccaa ggaccgag 1440
cccctgacca gcctgaagag cctgttcggc agcgacccc tgagccagta a 1491

```

<210> 100

<211> 1491

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Gag_TV2_C_ZAwT

<400> 100

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atgggtgcga gagcgtcaat attaagaggg ggaaaattag acaaattgga aaaaattagg 60
ttacggccag gggggagaaa acactatatg ctaaaacacc tagtatgggc aagcagagag 120
ctggaaagat ttgcagttaa ccttggcctt ttagagacat cagacggatg tagacaaata 180
ataaaacagc tacaaccagc tcttcagaca ggaacagagg aaattagatc attatttaac 240
acagtagcaa ctctctattg tgtacataaa gggatagatg tacgagacac caaggaagcc 300
ttagacaaga tagaggagga aaaaaacaaa tgtcagcaaa aaacacagca ggcggaagcg 360
gctgacaaaa aggtcagtca aaattatcct atagtgcaga acctccaagg gcaaattgta 420
caccaggcca tatcacctag aaccttgaat gcatgggtaa aagtaataga ggagaaggct 480
tttagccag aggtaatacc catgtttaca gcattatcag aaggagccac cccacaagat 540
ttaaacacca tgtaaatac agtgggggga catcaagcag ccatgcaaat gttaaaagat 600
accatcaatg aggaggctgc agaatgggat aggttacatc cagtacatgc agggcctgtt 660
gcaccaggcc agatgagaga accaagggga agtgacatag caggaaactac tagtaccctt 720
caagaacaaa tagcatggat gacaagtaac ccacatatcc cagtagggga catctataaa 780
aggtggataa ttctgggggt aaataaaaata gtaagaatgt acagccctgt cagcatttta 840
gacataaaac aaggacaaaa ggaacccttt agagactatg tagaccggtt cttcaaaact 900
ttaagagctg aacaatctac acaagaggta aaaaattgga tgacagacac cttgttagtc 960
caaatgcga acccagattg taagaccatt ttaagagcat taggaccagg ggcttcatta 1020
gaagaaatga tgacagcatg tcagggagtg ggaggacct gccacaaagc aagaqttttg 1080
gctgaggcaa tgagccaagc aaacaataca agtghtaatga tacagaaaag caatttttaa 1140
ggccctagaa gagctgttaa atgtttcaac tgtggcaggg aagggcacat agccaggaat 1200
tgcaggggcc ctaggaaaag gggctgttgg aaatgtggaa aggaaggaca ccaaatgaaa 1260
gactgtactg agaggcaggc taatttttta gggaaaattt ggccttccca caaggggagg 1320

```

```
ccaggaatt tccttcagag cagaccagag ccaacagccc caccactaga accaacagcc 1380
ccaccagcag agagcttcaa gttcaaggag actccgaagc aggagccgaa agacagggaa 1440
cctttaactt ccctcaaate actctttggc agcgaccctt tgtctcaata a 1491
```

<210> 101

<211> 624

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Nef_TV2_C_ZAopt

<400> 101

```
atggggcgga agtggagcaa gagcagcatc atcggtctggc ccgaggtgag cgagcgcatc 60
cgccgcaccc gcagcgccgc cgagggcggtg ggagcgcca gccaggacct ggagaagcac 120
ggcgccctga ccaccagcaa caccgcccac aacaacgccc cctgcgcctg gctggaggcc 180
caggaggagg agggcgaggt gggtttcccc gtgcgcccc aggtgcccc gcgccccatg 240
acctacaagg ccgcatcga cctgagcttc ttctgaagg agaaggcgcg cctggagggc 300
ctgatctaca gcaagaagcg ccaggagatc ctggacctgt gggtgtacaa caccagggc 360
ttcttccccg actggcagaa ctacaccccc ggccccggcg tgcgttccc cctgaccttc 420
ggctggtact tcaagctgga gcccggtggc ccccgcgagg tggaggaggc caacgagggc 480
gagaacaact gcctgctgca ccccatgagc cagcacggca tggaggacga ggaccgag 540
gtgctgcgct ggaagttcga cagcaccctg gcccgccgac acatggcccc cgagctgcac 600
cccgagtact acaaggactg ctga 624
```

<210> 102

<211> 624

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Nef_TV2_C_ZA_wt

<400> 102

```
atgggggggca agtgggtcaaa aagcagtata attggatggc ctgaagtaag agaaagaatc 60
agacgaacta ggtcagcagc agagggagta ggatcagcgt ctcaagactt agagaaacat 120
gggggcactta caaccagcaa cacagcccac aacaatgctg cttgcgcctg gctggaagcg 180
caagaggagg aaggagaagt aggttttcca gtcagacctc aggtaccttt aagaccaatg 240
acttataaag cagcaataga tctcagcttc tttttaaaag aaaagggggg actggaaggg 300
ttaatttact ccaagaaaag gcaagagatc ctgatttgtt gggtttataa cacacaaggc 360
ttcttcctg attggcaaaa ctacacaccg ggaccagggg tcagatttcc actgaccttt 420
ggatggtact tcaagctaga gccagtcgat ccaagggaag tagaaggagg caatgaagga 480
gaaaacaact gtttactaca ccctatgagc cagcatggaa tggaggatga agacagagaa 540
gtattaagat ggaagtttga cagtacgcta gcacgcagac acatggcccc cgagctacat 600
ccggagtatt acaaagactg ctga 624
```

<210> 103

<211> 3009

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Pol_TV2_C_ZAopt

<400> 103

```
ttcttccgag agaactggc ctccccccag ggcgaggccc gcgagttccc cagcgagcag 60
accgcgcca acagcccac caccgcacc aacagcccca ccagccgaga gctgcagggtg 120
```

```

cagggcgaca gcgaggccgg cgccgagcgc cagggcacct tcaacttccc ccagatcacc 180
ctgtggcagc gccccctggt gagcatcaag gtggccggcc agaccaagga ggccctgctg 240
gacaccggcg ccgacgacac cgtgctggag gagatcaacc tgcccggcaa gtggaagccc 300
aagatcgatcg cgggcacggg cggcttcacg aaggtgcgcc agtacgacca gatcctgac 360
gagatctgcg gcaagcgcg ccatcgccacc gtgctggtgg gccccacccc cgtgaacatc 420
atcgcccgca acctgctgac ccagctgggc tgaccctga acttccccat cagccccatc 480
gagaccgtgc ccgtgaagct gaagcccggc atggacggcc ccaaggtgaa gcagtggccc 540
ctgaccgagg agaagatcaa ggccctgacc gagatctgcg aggagatgga gaaggagggc 600
aagatcacca agatcgggcc cgagaacccc tacaacaccc ccgtgttcgc catcaagaag 660
aaggacagca ccaagtggcg caagctggtg gacttccgcg agctgaacaa gcgcacccag 720
gacttctggg aggtgcagct gggcatcccc caccgcccg gcctgaagaa gaagaagagc 780
gtgaccgtgc tggacgtggg cgacgcctac ttcagcgtgc cctggacga gagcttccg 840
aagtacaccg ccttcacccat ccccagcatc aacaacgaga ccccgccat ccgctaccag 900
tacaacgtgc tgcccagggg ctggaagggc agccccgcca tcttccagag cagcatgacc 960
cgcatcctgg agcccttccg caccagaac cccgaggtgg tgatctacca gtacatggac 1020
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cgcgccacc tgctgaagtg gggcttcacc accccgcaca agaagcacca gaaggagccc 1140
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gccaacccgc agaccaagat cggcaaggcc ggctacgtga ccgacaaggg ccgccagaag 1860
gtggtgagct tcaccgagac caccaaccag aagaccgagc tgcaggccat ccagctggcc 1920
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aagggcgagg ccattgcacgg ccaggtggac tgcagccccg gcacatggca gctggactgc 2340
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cgcgaccagg ccgagcacct gaagaccgcc gtgcagatgg ccgtgttcac ccacaacttc 2700
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agcgacatcc agaccaagga gctgcagaag cagatcatca agatccagaa cttccgcgtg 2820
tactaccgcg acagccgcga ccccatctgg aagggccccg ccaagctgct gtggaagggc 2880
gagggcgccg ttgtgatcca ggacaacagc gacatcaagg tggcgccccg ccgcaaggcc 2940
aagatcatca aggactacgg caagcagatg gccggcgccg actgcgtggc cggccgccag 3000
gacgaggac
3009

```

<210> 104

<211> 3009

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Pol_TV2_C_ZAwT

<400> 104

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tttttttaggg aaaatttggc cttcccacaa ggggaggcca gggaatttcc ttcagagcag 60
accagagcca acagccccac cactagaacc aacagcccca ccagcagaga gcttcaagtt 120
caaggagact ccgaagcagg agccgaaaga cagggaacct ttaacttccc tcaaactact 180
ctttggcagc gaccccttgt ctcaataaaa gtagcgggcc aaacaaagga ggctctttta 240
gatacaggag cagatgatac agtactagaa gaaataaact tgccaggaaa atggaaacca 300
aaaatgatag gaggaattgg aggttttatac aaagtaagac agtatgatca aatacttata 360
gaaatttgtg gaaaaagggc tataggtaca gtattagtag gacctacacc tgtcaacata 420
attggaagaa atctgttgac tcagcttgga tgcacactaa attttccaat tagccccatt 480
gaaactgtac cagtaaaaatt aaagccagga atggatggcc caaagggttaa acaatggcca 540
ttgacagaag aaaaaataaa agcattaaca gaaatttgtg aggaaatgga gaaggaagga 600
aaaattacaa aaattggggc tgaaaatcca tataacactc cagtatttgc cataaagaag 660
aaggacagta caaagtggag aaaattagta gatttcaggg aactcaataa aagaactcaa 720
gacttttggg aagtccaatt aggaatacca caccagcag ggtaaaaaaa gaaaaaatca 780
gtgacagtac tggatgtggg agatgcatat ttttcagtc ctttagatga gagcttcaga 840
aaatatactg cattcaccat acctagtata aacaatgaaa caccagggat tagatatcaa 900
tataactgtt tccacagagg atggaaagga tcaccagcaa tattccagag tagcatgaca 960
agaatcttag agcccttttag aacacaaaac ccagaagtag ttatctatca atatatggat 1020
gacttatatg taggatctga cttagaaata gggcaacata gagcaaaaat agaggagtta 1080
agaggacacc tattgaaatg gggatttacc acaccagaca agaaacatca gaaagaaccc 1140
ccatttcttt ggatggggta tgaactccat cctgacaaat ggacagtaca gcctatacag 1200
ctgccagaaa aggagagctg gactgtcaat gatatacaga agttagtggg aaagttaaac 1260
tgggcaagtc agatttacc agggattaaa gtaaggcaac tgtgtaaact ccttagggga 1320
gccaaagcac taacagacat agtgccactg actgaagaag cagaattaga attggctgag 1380
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tttaaaaatc tgagaacagg aaagtatgca aaaatgagga ctgcccacac taatgatgtg 1560
aaacagttag cagaggcagt gcaaaagata acccaggaaa gcatagtaat atggggaaaa 1620
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gccaataggg aaactaaaat aggaaaagca ggtatgtca ctgacaaagg aaggcagaaa 1860
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acacatttag aaggaaaaat catcctagta gcagtccatg tagccagtgg ctacatggaa 2400
gcagaggtta tcccagcaga aacaggacaa gaaacagcat actttatact aaaattagca 2460
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gttaaggcag cctgttggtg ggcagatatc caacgggaat ttggaattcc ctacaatccc 2580
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agagatcaag ctgagcacct taagacagca gtacaaatgg cagtattcat tcacaatttt 2700
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tcagacatac aaactaaaga attacaaaaa caaattataa aaattcaaaa ttttcggggt 2820
tattacagag acagcagaga ccctatttgg aaaggaccag ccaaactact ctggaaaggt 2880
gaaggggcag tagtaataca agataaatag gatataaagg tagtaccaag aaggaaagca 2940
aaaatcatta aggactatgg aaaacagatg gcaggtgctg attgtgtggc aggtagacag 3000
gargagat. 3009
```

<210> 105

<211> 75

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: RevExon1_TV2_C_ZAopt

<400> 105

atggcggcc gcagcggcga cagcgacgag gccctgctgc aggccatcaa gatcatcaag 60
atcctgtacc agagc 75

<210> 106

<211> 76

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: RevExon1_TV2_C_ZAwt

<400> 106

atggcaggaa gaagcggaga cagcgacgaa gcgctcctcc aagcaataaa gatcatcaag 60
atcctctacc aaagca 76

<210> 107

<211> 246

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: RevExon2_TV2_C_ZAopt

<400> 107

ccctacccca agcccagagg caccggccag gccgcgcga accgcccgcg ccgctggcgc 60
gcccgcagc agcagatcca cagcatcagc gagcgcatcc tggacacctg cctggggccgc 120
cccaccaagc ccgtgcccct gctgctgccc cccatcgagc gcctgcacat caactgcagc 180
gagagcagcg gcaccagcgg caccagtag agccagggca ccgcccaggg cgtggggcaac 240
ccctaa 246

<210> 108

<211> 248

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: RevExon2_TV2_C_ZAwt

<400> 108

acccttatcc caaaccgag gggacccgac aggctcggag gaatcgaaga agaaggtgga 60
gagcaagaca gcagcagatc cattcgatta gtgagcggat tcttgacact tgcctgggac 120
gacctacgaa gcctgtgcct cttctgtac caccgattga gagacttcat attaattgta 180
gtgagagcag tggaacttct gggacacagt agtctcaggg gactgcagag ggggtgggga 240
acccttaa 248

<210> 109

<211> 216

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: TatExon1_TV2_C_ZAopt

<400> 109

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atggagccca tgcaccccaa cctggagccc tggaaaccacc ccggcagcca gccaagacc 60
gcctgcaacg gctgctactg caagcgctgc agctaccact gcctggtgtg cttccagaag 120
aagggcctgg gcatctacta cggccgcaag aagcgccgcc agcgccgcag ccccccccc 180
agcaacaagg accaccagga cccctgccc aagcag 216
```

<210> 110

<211> 216

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: TatExon1_TV2_C_ZAwt

<400> 110

```
atggagccaa tagatcctaa cctagaaccc tggaaaccatc caggaagtca gcctaaaact 60
gcttgtaatg ggtgttactg taaacgttgc agctatcatt gtctagtttg ctttcagaaa 120
aaaggccttag gcatttacta tggcaggaag aagcgagagac agcgacgaag cgctcctcca 180
agcaataaag atcatcaaga tcctctacca aagcag 216
```

<210> 111

<211> 90

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: TatExon2_TV2_C_ZAopt

<400> 111

```
cccctgagcc agaccgcgg cgacccacc ggcagcgagg agagcaagaa gaaggtggag 60
agcaagaccg ccgccgaccc cttcgactag 90
```

<210> 112

<211> 90

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: TatExon2_TV2_C_ZAwt

<400> 112

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cccttatccc aaacccgagg ggacccgaca ggctcggagg aatcgaagaa gaaggtggag 60
agcaagacag cagcagatcc attcgattag 90
```

<210> 113

<211> 579

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Vif_TV2_C_ZAopt

<400> 113

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atggagaacc gctggcaggt gctgatcgtg tggcaggtgg accgcatgaa gatccgcacc 60
tggcacagcc tggatgaagca ccacatgtac gtgagccgcc gcgccgacgg ctggttctac 120
```



```

cgccaccact acgagagccg ccaccccaag gtgagcagcg aggtgcacat cccctgggc 180
gacgcccgcg tggatgatcaa gacctactgg ggcctgcaga ccggcgagcg cgcctggcac 240
ctggggccacg gcgtgagcat cgagtggcgc ctgcccgcgt acagcaccca ggtggacccc 300
gacctgacgg accagctgat ccacatgcac tacttcgact gcttcgccga gagcgccatc 360
cgcaaggcca tcctgggcca gatcgtgagc cccaagtgcg actaccaggc cgccacacaac 420
aagggtgggca gcctgcagta cctggccctg accgcccctga tcaagcccaa gaagatcaag 480
ccccccctgc ccagcgtgcg caagctggtg gaggaccgct ggaacaagcc ccagaagacc 540
cgcgcccgcc gcggcaacca caccatgaac ggccactag 579

```

<210> 114

<211> 579

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Vif_TV2_C_ZAwT

<400> 114

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tggcacagtt tagtaaagca ccatatgtat gtttcgagga gagctgatgg atggttctac 120
agacatcatt atgaaagcag acacccaaaa gtaagttcag aagtacacat cccattagga 180
gatgccaggt tagtaataaa aacatattgg ggtctgcaga caggagaaaag agcttggcat 240
ttgggtcacg gagtctccat agaatggaga ttgagaagat atagcacaca agtagaccct 300
gacctgacag accaactaat tcatatgcat tattttgatt gttttgcaga atctgccata 360
aggaaagcca tactaggaca gatagttagc cctaagtgtg actatcaagc aggacataac 420
aaggtaggat ctctacaata cttggcactg acagcattga taaaaccaa aaagataaag 480
ccacctctgc ctagtgttag gaaattagta gaggatagat ggaacaagcc ccagaagacc 540
agggggccga gagggaacca tacaatgaat ggacactag 579

```

<210> 115

<211> 288

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Vpr_TV2_C_ZAopt

<400> 115

```

atggagcagg ccccgagga ccaggggccc cagcgcgagc cctacaacga gtggaccctg 60
gagctgctgg aggagctgaa gcaggaggcc gtgcgccact tccccgccc ctggctgcac 120
aacctgggccc agcacatcta cgagacctac ggcgacacct ggaccggcgt ggaggccatc 180
atccgcatcc tgcagcagct gctgttcate cacttccgca tcggctgccca ccacagccgc 240
atcgccatcc tgcgccagcg ccgcgcccgc aacggcgcca accgcagc 288

```

<210> 116

<211> 288

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Vpr_TV2_C_ZAwT

<400> 116

```

atggaacaag ccccagaaga ccaggggccg cagaggggaa catacaatga atggacacta 60
gagcttttag aagaactcaa gcagggaagct gtcagacact ttcctagacc atggctccat 120
aacttaggac aacatatcta tgaaacctat ggagatactt ggacaggagt tgaagcaata 180
ataagaatcc tgcaacaatt actgtttatt catttcagga ttgggtgccca tcatagcaga 240

```

ataggcattt tgcgacagag aagagcaaga aatggagcca atagatcc 288

<210> 117

<211> 261

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Vpu_TV2_C_ZAopt

<400> 117

```
atgctggacc tgaccgccc catcgacagc cgcttgggca tcggcgccct gatcgtggcc 60
ctgatcatcg ccatcatcgt gtggaccatc gtgtacatcg agtaccgcaa gctggtgcgc 120
cagcgcaaga tcgactggct ggtgaagcgc atccgcgagc gcgccgagga cagcggcaac 180
gagagcgagg gcgacaccga ggagctgagc accctggtgg acatgggcca cctgcgcctg 240
ctggacgcca acgacgtga a 261
```

<210> 118

<211> 261

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Vpu_TV2_C_ZAw

<400> 118

```
atgttagatt taactgcaag aatagattct agattaggaa taggagcatt gatagtagca 60
ctaatacatag caataatagt gtggaccata gtatatatag aatataggaa attggttaagg 120
caaaggaaaa tagactgggt agttaaagg attagggaaa gagcagaaga cagtggcaat 180
gagagcgagg gggatactga agaattatcg acactggtgg atatggggca tcttaggctt 240
ttggatgcta atgatgtga a 261
```

<210> 119

<211> 1473

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: gp120mod.TV1.delV2

<400> 119

```
gaattcatgc gcgtgatggg caccagaag aactgccagc agtgggtgat ctggggcatc 60
ctgggcttct ggatgctgat gatctgcaac accgaggacc tgtgggtgac cgtgtactac 120
ggcgtgcccg tgtggcgcca cgccaagacc accctgttct gcgccagcga cgccaaggcc 180
tacgagaccg aggtgcacaa cgtgtgggac acccagcct gcgtgcccac cgaccccaac 240
ccccaggaga tcgtgctggg caacgtgacc gagaacttca acatgtggaa gaacgacatg 300
gccgaccaga tgcacgagga cgtgatcagc ctgtgggacc agagcctgaa gccctgcgtg 360
aagctgaccc ccctgtgcgt gacctgaac tgcaccgaca ccaacgtgac cggcaaccgc 420
accgtgaccg gcaacagcac caacaacacc aacggcaccg gcatctacaa catcgaggag 480
atgaagaact gcagcttcaa cgccggcgcc ggccgcctga tcaactgcaa caccagcacc 540
atcaccagg cctgccccaa ggtgagcttc gaccccatcc ccatccacta ctgcgcccc 600
gccggtacg ccatcctgaa gtgcaacaac aagaccttca acggcaccg cccctgctac 660
aacgtgagca ccgtgcagtg caccacggc atcaagcccg tggtagcac ccagctgctg 720
ctgaacggca ccctggccga ggagggcatc atcatccgca gcgagaacct gaccgagaac 780
accaagacca tcctcgtgca cctgaacgag agcgtggaga tcaactgcac ccgccccaac 840
aacaacaccc gcaagagcgt gcgcatcggc cccggccagg ccttctacgc caccaacgac 900
gtgatcgcca acatccgcca ggcccactgc aacatcagca ccgaccgctg gaacaagacc 960
```

```

ctgcagcagg tgatgaagaa gctgggcgag cacttcccca acaagaccat ccagttcaag 1020
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ttctactgca acaccagcaa cctgttcaac agcacctacc acagcaacaa cggcacctac 1140
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cgcatgtggc agggcggtgg ccaggccacc tacgcccccc ccatcgccgg caacatcacc 1260
tgccgcagca acatcaccgg catcctgctg acccgcgacg gcggcttcaa caccaccaac 1320
aacaccgaga ccttccgccc cggcgggcgc gacatgcgcg acaactggcg cagcgagctg 1380
tacaagtaca aggtggtgga gatcaagccc ctgggcatcg cccccacaa ggccaagcgc 1440
cgcggtgtgc agcgcgagaa gcgctaactc gag 1473

```

<210> 120

<211> 1986

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: gp140mod.TV1.delV2

<400> 120

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gaattcatgc gcgtgatggg caccagaag aactgccagc agtgggtggat ctggggcatc 60
ctgggcttct ggatgctgat gatctgcaac accgaggacc tgtgggtgac cgtgtactac 120
ggcgtgcccc tgtggcgaga cgccaagacc accctgttct gcgccagcga cgccaaggcc 180
tacgagaccg aggtgcacaa cgtgtggggc acccagcct gcgtgcccac cgacccaac 240
ccccaggaga tcgtgtggg caacgtgacc gagaacttca acatgtggaa gaacgacatg 300
gccgaccaga tgcacgagga cgtgatcagc ctgtgggacc agagcctgaa gccctgcgtg 360
aagctgaccc ccctgtgctg gaccctgaac tgcaccgaca ccaacgtgac cggcaaccgc 420
accgtgaccg gcaacagcac caacaacacc aacggcaccg gcatctacaa catcgaggag 480
atgaagaact gcagcttcaa cgccggcgcc ggccgcctga tcaactgcaa caccagcacc 540
atcaccagg cctgccccaa ggtgagcttc gaccccatcc ccattccacta ctgcgcccc 600
gccggtctac ccatcctgaa gtgcaacaac aagaccttca acggcaccgg ccctgtctac 660
aacgtgagca ccgtgcagt caccacggc atcaagcccc tggtagcac ccagctgctg 720
ctgaacggca gcctggccga ggagggcac atcatccga gcgagaacct gaccgagac 780
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aacaacaccc gcaagagcgt gcgcatcgcc cccggccagg ccttctacgc caccaacgac 900
gtgatcgcca acatccgcca ggcccactgc aacatcagca ccgaccgctg gaacaagacc 960
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ccccacgccg gcggcgacct ggagatcacc atgcacagct tcaactgccg cggcgagtgc 1080
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cgcatgtggc agggcggtgg ccaggccacc tacgcccccc ccatcgccgg caacatcacc 1260
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ctgctgagcg gcatcgtgca gcagcagagc aacctgctga aggccatcga ggcccagcag 1620
cacatgctgc agctgaccgt gtggggcatc aagcagctgc agggccgctg gctggccatc 1680
gagcgctacc tgaaggacca gcagctgctg ggcacctggg gctgcagcgg ccgcctgac 1740
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gacaacatga cctggatgca gtgggaccgc gagatcagca actacaccgg cctgatctac 1860
aacctgctgg aggacagcca gaaccagcag gagaagaacg agaaggacct gctggagctg 1920
gacaagtgga acaacctgtg gaactggttc gacatcagca actggccctg gtacatctaa 1980
ctcag 1986

```

<210> 121

<211> 1986

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: gpl40mod.TV1.mut7.delV2

<400> 121

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ctgggcttct ggatgctgat gatctgcaac accgaggacc tgtgggtgac cgtgtactac 120
ggcgtgcccg tgtggcgca cgccaagacc accctgttct gcgccagcga cgccaaggcc 180
tacgagaccg aggtgcacaa cgtgtgggac acccagcct gcgtgccac cgacccaac 240
ccccaggaga tcgtgctggg caacgtgacc gagaacttca acatgtggaa gaacgacatg 300
gccgaccaga tgcacgagga cgtgatcagc ctgtgggacc agagcctgaa gccctgcgtg 360
aagctgaccc ccctgtgcgt gaccctgaac tgcaccgaca ccaacgtgac cggcaaccgc 420
accgtgaccg gcaacagcac caacaacacc aacggcaccg gcatctacaa catcgaggag 480
atgaagaact gcagcttcaa cgccggcgcc ggccgcctga tcaactgcaa caccagcacc 540
atcaccagg cctgccccaa ggtgagcttc gaccccatcc ccatccacta ctgcgcccc 600
gccggctacg ccctcctgaa gtgcaacaac aagaccttca acggcaccgg cccctgctac 660
aacgtgagca ccgtgcagt caccacggc atcaagccc tggtgagcac ccagctgctg 720
ctgaacggca gcctggccga ggagggcac atcatccga gcgagaacct gaccgagaac 780
accaagacca tcctcgtgca cctgaacgag agcgtggaga tcaactgcac ccgccccaa 840
aacaacaccc gcaagagcgt gcgcatcgcc cccggccagg ccttctacgc caccaacgac 900
gtgatcgcca acatccgcca ggcccactgc aacatcagca ccgaccgctg gaacaagacc 960
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cgcattgtgc agggcgtggg ccaggccacc tacgcccccc ccatcgccgg caacatcacc 1260
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cacatgctgc agctgacctg gtggggcatc aagcagctgc agggccgctg gctggccatc 1680
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aacctgctgg aggacagcca gaaccagcag gagaagaacg agaaggacct gctggagctg 1920
gacaagtggg acaacctgtg gaactggttc gacatcagca actggccctg gtacatctaa 1980
ctcgag
```

<210> 122

<211> 2397

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: gpl60mod.TV1.delV1V2

<400> 122

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gaattcatgc gcgtgatggg caccagaag aactgccagc agtgggtggat ctggggcatc 60
ctgggcttct ggatgctgat gatctgcaac accgaggacc tgtgggtgac cgtgtactac 120
ggcgtgcccg tgtggcgca cgccaagacc accctgttct gcgccagcga cgccaaggcc 180
tacgagaccg aggtgcacaa cgtgtgggac acccagcct gcgtgccac cgacccaac 240
ccccaggaga tcgtgctggg caacgtgacc gagaacttca acatgtggaa gaacgacatg 300
gccgaccaga tgcacgagga cgtgatcagc ctgtgggacc agagcctgaa gccctgcgtg 360
aagctgaccc ccctgtgcgt gggcgccggc aactgcaaca ccagcaccat caccagggcc 420
```

tgccccaagg	tgagcttcga	ccccatcccc	atccactact	gcgccccgcg	cggctacgcc	480
atcctgaagt	gcaacaacaa	gaccttcaac	ggcaccggcc	cctgctacaa	cgtgagcacc	540
gtgcagtga	cccacggcat	caagcccgtg	gtgagcacc	agctgctgct	gaacggcagc	600
ctggccgagg	agggcatcat	catccgcagc	gagaacctga	ccgagaacac	caagaccatc	660
atcgtgcacc	tgaacgagag	cgtggagatc	aactgcaccc	gccccacaa	caacacccgc	720
aagagcgtgc	gcatcggccc	cggccaggcc	ttctacgcca	ccaacgacgt	gatcggcaac	780
atccgccagg	cccactgcaa	catcagcacc	gaccgctgga	acaagaccct	gcagcagggtg	840
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ggcgacctgg	agatcaccat	gcacagcttc	aactgcgcgc	gcgagttctt	ctactgcaac	960
accagcaacc	tgttcaacag	cacctaccac	agcaacaacg	gcacctacaa	gtacaacggc	1020
aacagcagca	gccccatcac	cctgcagtgc	aagatcaagc	agatcgtgcg	catgtggcag	1080
ggcgtggggc	aggccaccta	cgcacccccc	atcgccggca	acatcacctg	ccgcagcaac	1140
atcaccggca	tcctgctgac	ccgcgacggc	ggcttcaaca	ccaccaacaa	caccgagacc	1200
ttccgccccg	gcggcgggca	catgcgcgac	aactggcgca	gcgagctgta	caagtacaag	1260
gtggtggaga	tcaagcccct	gggcatcgcc	cccaccaagg	ccaagcgccg	cgtggtgcag	1320
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ctgacctgtg	ggggcatcaa	gcagctgcag	gcccgcgtgc	tgcccatcga	gcgctacctg	1560
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gtgcgcctag	gctacagccc	cctgagcttc	cagaccctga	ccccagccc	ccgcggcctg	1980
gaccgcctgg	gcggcatcga	ggaggagggc	ggcgagcagg	accgcgaccg	cagcatccgc	2040
ctggtgagcg	gcttcctgag	cctggcctgg	gacgacctgc	gcaacctgtg	cctgttcagc	2100
taccaccgcc	tgcgcgactt	catcctgatc	gccgtgcgcg	ccgtggagct	gctgggccac	2160
agcagcctgc	gcggcctgca	gcgcggctgg	gagatcctga	agtacctggg	cagcctgggtg	2220
cagtactggg	gcctggagct	gaagaagagc	gccatcagcc	tgctggacac	catcgccatc	2280
accgtggccg	agggcaccga	ccgcacatc	gagctggtgc	agcgcatctg	ccgcgccatc	2340
ctgaacatcc	cccgcgcgat	ccgccagggc	ttcgaggccg	ccctgctgta	actcgag	2397

<210> 123

<211> 2529

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: gp160mod.TV1.delV2

<400> 123

gaattcatgc	gcgtgatggg	caccagaag	aactgccagc	agtgggtggat	ctggggcatc	60
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ggcgtgcccg	tgtggcgca	cgccaagacc	acctgttct	gcgccagcga	cgccaaggcc	180
tacgagaccg	aggtgcacaa	cgtgtggggc	accacgcct	gcgtgccac	cgaccccaac	240
ccccaggaga	tcgtgctggg	caacgtgacc	gagaacttca	acatgtggaa	gaacgacatg	300
gccgaccaga	tgcacgagga	cgtgatcagc	ctgtgggacc	agagcctgaa	gccctgcgtg	360
aagctgaccc	ccctgtgcgt	gaccctgaac	tgcaccgaca	ccaacgtgac	cggcaaccgc	420
accgtgaccg	gcaacagcac	caacaacacc	aacggcaccg	gcactacaa	catcgaggag	480
atgaagaact	gcagcttcaa	cgcggcgccc	ggccgcctga	tcaactgcaa	caccagcacc	540
atcacccagg	cctgccccaa	ggtgagcttc	gaccccatcc	ccatccacta	ctgcgcccc	600
gccggctagc	ccatcctgaa	gtgcaacaac	aagacettca	acggcaccgg	cccctgctac	660
aacgtgtagc	ccgtgcagtg	cacccacggc	ataagcccgc	tgggtgagcac	ccagctgctg	720
ctgaacggca	gcctggccga	ggagggcatc	atcatccgca	gcgagaacct	gaccgagaac	780
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ctgcagcagg tgatgaagaa gctgggcgag cacttcccca acaagaccat ccagttcaag 1020
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cgcatgtggc agggcggtgg ccaggccacc tacgcccccc ccacgcccgg caacatcacc 1260
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ctgctgggca acagcagcct gcgcggcctg cgcgcggct gggagatcct gaagtacctg 2340
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accatcgcca tcaccgtggc cgagggcacc gaccgcatca tcgagctggt gcagcgcac 2460
tgccgcgcca tctgaacat ccccgccgca atccgccagg gcttcgaggc cgcctgctg 2520
taactcgag 2529

```

<210> 124

<211> 2529

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: gp160mod.TV1.mut7.delV2

<400> 124

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ggcgtgcccg tgtggcgcca cgccaagacc accctgttct gcgccagcga cgccaaggcc 180
tacgagaccg aggtgcacaa cgtgtggggc acccagcct gcgtgcccac cgacccaac 240
ccccaggaga tcgtgctggg caacgtgacc gagaacttca acatgtggaa gaacgacatg 300
gccgaccaga tgcacgagga cgtgatcagc ctgtgggacc agagcctgaa gccctgcgtg 360
aagctgacct ccctgtgctg gacctgaac tgcaccgaca ccaacgtgac cggcaaccgc 420
accgtgaccg gcaacagcac caacaacacc aacggcaccg gcatctacaa catcgaggag 480
atgaagaact gcagcttcaa cgccggcgcc ggccgcctga tcaactgcaa caccagcacc 540
atcaccaggc cctgccccaa ggtgagcttc gaccccatcc ccactcacta ctgcgcccc 600
gccggctacg ccactctgaa gtgcaacaac aagaccttca acggcaccgg cccctgctac 660
aacgtgagca ccgtgcagtg caccacggc atcaagcccg tggtagcac ccagctgctg 720
ctgaacggca gcctggccga ggagggcac atcatccgca gcgagaacct gaccgagaac 780
accaagacca tcatcgtgca cctgaacgag agcgtggaga tcaactgcac ccgccccaac 840
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ctgcagcagg tgatgaagaa gctgggcgag cacttcccca acaagaccat ccagttcaag 1020
ccccacgccg gggcgacact ggagatcacc atgcacagct tcaactgccg cggcgagtgc 1080

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ttctactgca	acaccagcaa	cctgttcaac	agcacctacc	acagcaacaa	cggcacctac	1140
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cgcatgtggc	agggcggtgg	ccaggccacc	tacgcccccc	ccatcgccgg	caacatcacc	1260
tgccgcagca	acatcacccg	catcctgctg	accgcgcagc	gcggcttcaa	caccaccaac	1320
aacaccgaga	ccttcgcccc	cggcgggcgg	gacatgcgcg	acaactggcg	cagcgagctg	1380
tacaagtaca	aggtggtgga	gatcaagccc	ctgggcatcg	ccccaccaa	ggccatcagc	1440
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ggcgccggcg	gcagcaccat	gggcgcgcgc	agcatcaccc	tgaccgtgca	ggcccgcag	1560
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gagcgctacc	tgaaggacca	gcagctgctg	ggcatctggg	gctgcagcgg	ccgcctgac	1740
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taactcgag						2529

<210> 125

<211> 2613

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: gp160mod.TV1.tpa1

<400> 125

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gtgcccggtg	ggcgcgacgc	caagaccacc	ctgtttctgc	ccagcgacgc	caaggcctac	180
gagaccgagg	tgcaaacgt	gtgggccacc	cacgcctgcg	tgcccaccga	ccccaacccc	240
caggagatcg	tgctgggcaa	cgtgaccgag	aacttcaaca	tgtggaagaa	cgacatggcc	300
gaccagatgc	acgaggacgt	gatcagcctg	tgggaccaga	gcctgaagcc	ctgcgtgaag	360
ctgaccccc	tgtgcgtgac	cctgaactgc	accgacacca	acgtgaccgg	caaccgcacc	420
gtgaccggca	acagcaccaa	caacaccaac	ggcaccggca	tctacaacat	cgaggagatg	480
aagaactgca	gcttcaacgc	caccaccgag	ctgcgcgaca	agaagcacia	ggagtacgcc	540
ctgttctacc	gcctggacat	cgtgcccctg	aacgagaaca	gcgacaactt	cacctaccgc	600
ctgatcaact	gcaacaccag	caccatcacc	caggcctgcc	ccaaggtgag	cttcgacccc	660
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ccccccatcg	cgggcaacat	cacctgccgc	agcaacatca	cgggcatcct	gctgaccgcg	1380
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aagagcgcca	tcagcctgct	ggacaccatc	gccatcaccg	tggccgagg	caccgaccgc	2520
atcatcgagc	tgggtgcagc	catctgccgc	gccatcctga	acatcccccg	ccgcacccgc	2580
cagggcttcg	aggccgccct	gctgtaactc	gag			2613

<210> 126

<211> 2616

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: gp160mod.TV1

<400> 126

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ggcgtgccc	tgtggcgcca	cgccaagacc	acctgttct	gcgccagcga	cgccaaggcc	180
tacgagaccg	agggtgcaca	cgtgtgggcc	accacgcct	gcgtgccac	cgaccccaac	240
ccccaggaga	tcgtgctggg	caacgtgacc	gagaacttca	acatgtggaa	gaacgacatg	300
gccgaccaga	tgcacgagga	cgtgatcagc	ctgtgggacc	agagcctgaa	gccctgcgtg	360
aagctgaccc	ccctgtgcgt	gacctgaac	tgcaccgaca	ccaacgtgac	cggaaccgc	420
accgtgaccg	gcaacagcac	caacaacacc	aacggcaccg	gcactctaaa	catcgaggag	480
atgaagaact	gcagcttcaa	cgccaccacc	gagctgcgcg	acaagaagca	caaggagtac	540
gccctgttct	accgcctgga	catcgtgccc	ctgaacgaga	acagcgacaa	cttcacctac	600
cgctgatca	actgcaaac	cagcaccatc	accaggcct	gccccaaagt	gagcttcgac	660
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gtggagatca	actgcacccg	ccccacaac	aacacccgca	agagcgtgcg	catcgggccc	960
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atcagcaccg	accgctggaa	caagaccctg	cagcaggtga	tgaagaagct	gggcgagcac	1080
ttccccaaca	agaccatcca	gttcaagccc	cacgcggcg	gcgacctgga	gatcaccatg	1140
cacagcttca	actgccgcgg	cgagttcttc	tactgcaaca	ccagcaacct	gttcaacagc	1200
acctaccaca	gcaacaacgg	cacctacaag	tacaacggca	acaqcaqcaq	ccccatcacc	1260
ctgcagtga	agatcaagca	gatcgtgcgc	atgtggcagg	gcgtgggcca	ggccacctac	1320
gcccccccca	tcgcccggca	catcacctgc	cgcagcaaca	tcacccgcat	cctgctgacc	1380
cgcgacggcg	gcttcaaac	caccaacaac	accgagacct	tccgccccgg	cggcgggcag	1440
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aagaagagcg acctcagcct gctggacacc atcgccatca ccgtggccga gggcaccgac 2520
cgcatcatcg atctggtgca gcgcatctgc cgcgccatcc tgaacatccc ccgcccgcac 2580
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<210> 127

<211> 2616

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: gp160mod.TV1.wtLnative

<400> 127

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ggcgtgcccc agtggcgca cgccaagacc accctgttct gcgcagcga cgccaaggcc 180
tacgagaccg aggtgcacaa cgtgtgggcc acccagcct gcgtgcccac cgaccccaac 240
ccccaggaga tcgtgctggg caacgtgacc gagaacttca acatgtggaa gaacgacatg 300
gccgaccaga tgcacgagga cgtgatcagc ctgtgggacc agagcctgaa gccctgcgtg 360
aagctgaccc ccctgtgctg gacctgaac tgcaccgaca ccaacgtgac cggcaaccgc 420
accgtgaccg gcaacagcac caacaacacc aacggcaccg gcatctacaa catcgaggag 480
atgaagaact gcagcttcaa cgccaccacc gagctgcgcg acaagaagca caaggagtac 540
gccctgttct accgcctgga catcgtgccc ctgaacgaga acagcgacaa cttcacctac 600
cgctgatca actgcaaac cagcaccatc acccaggcct gcccaagggt gagcttcgac 660
cccatcccca tccactactg cgcccccgcc ggctacgcca tcctgaagtg caacaacaag 720
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aagcccgtgg tgagcaccca gctgctgctg aacggcagcc tggccgagga gggcatcatc 840
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atcacctga ccgtgcaggc ccgccagctg ctgagcggca tcgtgcagca gcagagcaac 1680

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ctgctgaagg ccatcgaggc ccagcagcac atgctgcagc tgaccgtgtg gggcatcaag 1740
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<210> 128

<211> 2604

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Wild-type Env
gp160 (8_2_ZA)

<400> 128

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cctgtgtgga gagacgcaaa aactactcta ttctgtgcat cagatgctaa agcatatgag 180
acagaagtgc ataatgtctg ggctacacat gcctgtgtac ccacagaccc caaccacaa 240
gaaatagtgt tgggaaatgt aacagaaaat ttaatatgt ggaaaaatga catggcagat 300
cagatgcatg aggatgtaat cagtttatgg gatcaaagcc taaagccatg tgtaaagtgt 360
acccactct gtgtcacttt aaactgtaca gatacaaatg ttacaggtaa tagaactgtt 420
acaggtaata gtaccaataa tacaaatggg acaggatatt ataacattga agaaatgaaa 480
aattgctctt tcaatgcaac cacagaatta agagataaga aacataaaga gtatgcactc 540
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ataaattgca atacctcaac cataacacaa gcctgtccaa aggtctcttt tgacccgatt 660
cctatacatt actgtgtccc agctggttat gcgattctaa agtgaataa taagacattc 720
aatgggacag gaccatgtta taatgtcagc acagtacaat gtacacatgg aattaagcca 780
gtggtatcaa ctcaattact gttaaattgg agtctagcag aagaagggat aataattaga 840
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gcattctatg caacaaatga tghtaatagga aacataagac aagcacattg taacattagt 1020
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aaggctatag aggcgcaaca gcataatgtt caactcacag tctggggcat taagcagctc 1740
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ggctttgaag cagctttgct ataa 2604

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<210> 129
 <211> 10
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: wild-type
 amino acid sequence changed by mutation in
 gp120/gp41 cleavage site

<400> 129
 Lys Arg Arg Val Val Gln Arg Glu Lys Arg
 1 5 10

<210> 130
 <211> 10
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: wild-type
 amino acid sequence changed by mutation in
 gp120/gp41 cleavage site

<400> 130
 Ile Ser Ser Val Val Gln Ser Glu Lys Ser
 1 5 10

<210> 131
 <211> 2052
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: gp140mod.TV1.tpa1

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 cgcgacgcca agaccaccct gttctgcgcc agcgacgcca aggcctacga gaccgaggtg 180

cacaacgtgt	gggccaccca	cgcctgcgtg	cccaccgacc	ccaaccccc	ggagatcgtg	240
ctggggcaacg	tgaccgagaa	cttcaacatg	tggaagaacg	acatggccga	ccagatgcac	300
gaggacgtga	tcagcctgtg	ggaccagagc	ctgaagccct	gcgtgaagct	gacccccctg	360
tgcgtgaccc	tgaactgcac	cgacaccaac	gtgaccggca	accgcaccgt	gaccggcaac	420
agcaccaaca	acaccaacgg	caccggcatc	tacaacatcg	aggagatgaa	gaactgcagc	480
ttcaacgcc	ccaccgagct	gcgcgacaag	aagcacaagg	agtacgccct	gttctaccgc	540
ctggacatcg	tgccccctgaa	cgagaacagc	gacaacttca	cctaccgcct	gatcaactgc	600
aacaccagca	ccatcaccca	ggcctgcccc	aaggtgagct	tcgaccccat	ccccatccac	660
tactgcgccc	ccgcccggcta	cgccatcctg	aagtgcacaa	acaagacctt	caacggcacc	720
ggcccctgct	acaacgtgag	caccgtgcag	tgacccacg	gcatcaagcc	cgtggtgagc	780
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gccaccaacg	acgtgatcgg	caacatccgc	caggcccaact	gcaacatcag	caccgaccgc	1020
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aaggacatct	gggacaacat	gacctggatg	cagtgggacc	gcgagatcag	caactacacc	1920
ggcctgatct	acaacctgct	ggaggacagc	cagaaccagc	aggagaagaa	cgagaaggac	1980
ctgctggagc	tggacaagtg	gaacaacctg	tggaaactggt	tcgacatcag	caactggccc	2040
tggtacatct	aa					2052

<210> 132

<211> 2073

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: gp140mod.TV1

<400> 132

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ggcgtgccc	tgtggcgcca	cgccaagacc	accctgttct	gcgccagcga	cgccaaggcc	180
tacgagaccg	aggtgcacaa	cgtgtggggc	accacgcct	gcgtgcccac	cgacccaac	240
ccccaggaga	tcgtgctggg	caacgtgacc	gagaacttca	acatgtggaa	gaacgacatg	300
gccgaccaga	tgacgagga	cgtgatcagc	ctgtgggacc	agagcctgaa	gccctgcgtg	360
aagctgaccc	ccctgtgctg	gacctgaac	tgacccgaca	ccaacgtgac	cggcaaccgc	420
accgtgaccg	gcaacagcac	caacaacacc	aacggcaccg	gcatctacaa	catcgaggag	480
atgaagaact	gcagcttcaa	cgccaccacc	gagctgcgcg	acaagaagca	caaggagtac	540
gccctgttct	accgcctgga	catcgtgccc	ctgaacgaga	acagcgacaa	cttcacctac	600
cgcctgatca	actgcaacac	cagcaccatc	accagggcct	gccccaaagg	gagcttcgac	660
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aagcccgctg	tgagcaccca	gctgctgctg	aacggcagcc	tggccgagga	gggcatcatc	840
atccgcagcg	agaacctgac	cgagaacacc	aagaccatca	tcgtgcacct	gaacgagagc	900

gtggagatca	actgcacccg	ccccaaacaac	aacacccgca	agagcgtgcg	catcggcccc	960
ggccaggcct	tctacgccac	caacgacgtg	atcggcaaca	tccgccaggc	ccactgcaac	1020
atcagcacccg	accgctggaa	caagaccctg	cagcaggtga	tgaagaagct	gggcgagcac	1080
ttccccaaca	agaccatcca	gttcaagccc	cacgcccggc	gcgacctgga	gatcaccatg	1140
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acctaccaca	gcaacaacgg	cacctacaag	tacaacggca	acagcagcag	ccccatcacc	1260
ctgcagtgca	agatcaagca	gatcgtgcgc	atgtggcagg	gcgtgggcca	ggccacctac	1320
gcccccccca	tcgccggcaa	catcacctgc	cgcagcaaca	tcaccggcat	cctgctgacc	1380
cgcgacggcg	gcttcaacac	caccaacaac	accgagacct	tccgccccgg	cggcggcgac	1440
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ggcatcgccc	ccaccaaggc	caagcgcgcg	gtggtgcagc	gcgagaagcg	cgccgtgggc	1560
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agcaacaaga	gcgagaagga	catctgggac	aacatgacct	ggatgcagtg	ggaccgcgag	1920
atcagcaact	acaccggcct	gatctacaac	ctgctggagg	acagccagaa	ccagcaggag	1980
aagaacgaga	aggacctgct	ggagctggag	aagtggaaaca	acctgtggaa	ctggttcgac	2040
atcagcaact	ggccctggta	catctaactc	gag			2073

<210> 133

<211> 2073

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: gpl40mod.TV1.wtLnative

<400> 133

gaattcatga	gagtgatggg	gacacagaag	aattgtcaac	aatgggtggat	atggggcatc	60
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ggcgtgccc	tgtggcgca	cgccaagacc	accctgttct	gcgccagcga	cgccaaggcc	180
tacgagaccg	aggtgcacaa	cgtgtgggccc	acccacgcct	gcgtgcccac	cgaccccaac	240
ccccaggaga	tcgtgctggg	caacgtgacc	gagaacttca	acatgtggaa	gaacgacatg	300
gccgaccaga	tgcacgagga	cgtgatcagc	ctgtgggacc	agagcctgaa	gccctgcgtg	360
aagctgaccc	ccctgtgctg	gaccctgaac	tgcaccgaca	ccaacgtgac	cggcaaccgc	420
accgtgaccg	gcaacagcac	caacaacacc	aacgggcaccg	gcactctaaa	catcgaggag	480
atgaagaact	gcagcttcaa	cgccaccacc	gagctgcgcg	acaagaagca	caaggagtac	540
gccctgttct	accgctgga	catcgtgccc	ctgaacgaga	acagcgacaa	cttcacctac	600
cgcctgatca	actgcaacac	cagcaccatc	acccaggcct	gccccaaagg	gagcttcgac	660
cccatcccca	tccactactg	cgcccccgcc	ggctacgccca	tcctgaagt	caacaacaag	720
accttcaacg	gcaccggccc	ctgctacaac	gtgagcaccg	tgacgtgcac	ccacggcatc	780
aagcccgctg	tgagcaccca	gctgctgctg	aacggcagcc	tgcccgagga	gggcatcatc	840
atccgcagcg	agaacctgac	cgagaacacc	aagaccatca	tcgtgcacct	gaacgagagc	900
gtggagatca	actgcacccg	ccccaaacaac	aacacccgca	agagcgtgcg	catcggcccc	960
ggccaggcct	tctacgccac	caacgacgtg	atcggcaaca	tccgccaggc	ccactgcaac	1020
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ttccccaaca	agaccatcca	gttcaagccc	cacgcccggc	gcgacctgga	gatcaccatg	1140
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acctaccaca	gcaacaacgg	cacctacaag	tacaacggca	acagcagcag	ccccatcacc	1260
ctgcagtgca	agatcaagca	gatcgtgcgc	atgtggcagg	gcgtgggcca	ggccacctac	1320
gcccccccca	tcgccggcaa	catcacctgc	cgcagcaaca	tcaccggcat	cctgctgacc	1380
cgcgacggcg	gcttcaacac	caccaacaac	accgagacct	tccgccccgg	cggcggcgac	1440
atgcgcgaca	actggcgcag	cgagctgtac	aagtacaagg	tggtggagat	caagcccctg	1500
ggcatcgccc	ccaccaaggc	caagcgcgcg	gtggtgcagc	gcgagaagcg	cgccgtgggc	1560
atcggcgcgg	tggtcctggg	cttcctgggc	gccgcccggc	gcaccatggg	cgccgccagc	1620

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atcacccctga ccgtgcaggc ccgccagctg ctgagcggca tcgtgcagca gcagagcaac 1680
ctgctgaagg ccacgcaggc ccagcagcac atgctgcagc tgaccgtgtg gggcatcaag 1740
cagctgcagg ccgcgctgct ggccatcgag cgctacctga aggaccagca gctgctgggc 1800
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atcagcaact acaccggcct gatctacaac ctgctggagg acagccagaa ccagcaggag 1980
aagaacgaga aggacctgct ggagctggac aagtggaaac acctgtggaa ctggttcgac 2040
atcagcaact ggccctggta catctaactc gag                                     2073

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<210> 134

<211> 624

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: NefD125G_TV2_C_ZAopt

<400> 134

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atgggcggca agtggagcaa gagcagcatc atcggctggc ccgaggtgcg cgagcgcatac 60
cgccgcaccc gcagcgccgc cgagggcgctg ggcagcgcca gccaggacct ggagaagcac 120
ggcgccctga ccaccagcaa caccgcccac aacaacgccg cctgcgcctg gctggaggcc 180
caggaggagg agggcgaggt gggcttcccc gtgcgcccc aggtgcccct gcgccccatg 240
acctacaagg ccgccatcga cctgagcttc ttctgaagg agaaggcgcg cctggagggc 300
ctgatctaca gcaagaagcg ccaggagatc ctggacctgt ggggtgtaaa caccagggc 360
ttcttccccg gctggcagaa ctacaccccc ggccccggcg tgcgttccc cctgaccttc 420
ggctggtact tcaagctgga gcccgctggac ccccgcgagg tggaggaggc caacgagggc 480
gagaacaact gcctgctgca ccccatgagc cagcacggca tggaggacga ggaccgcgag 540
gtgctgcgct ggaagttcga cagcaccctg gcccgccgcc acatggcccc cgagctgcac 600
cccgagtact acaaggactg ctga                                     624

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<210> 135

<211> 624

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: NefD125G-Myr_TV2_C_ZAopt

<400> 135

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cgccgcaccc gcagcgccgc cgagggcgctg ggcagcgcca gccaggacct ggagaagcac 120
ggcgccctga ccaccagcaa caccgcccac aacaacgccg cctgcgcctg gctggaggcc 180
caggaggagg agggcgaggt gggcttcccc gtgcgcccc aggtgcccct gcgccccatg 240
acctacaagg ccgccatcga cctgagcttc ttctgaagg agaaggcgcg cctggagggc 300
ctgatctaca gcaagaagcg ccaggagatc ctggacctgt ggggtgtaaa caccagggc 360
ttcttccccg gctggcagaa ctacaccccc ggccccggcg tgcgttccc cctgaccttc 420
ggctggtact tcaagctgga gcccgctggac ccccgcgagg tggaggaggc caacgagggc 480
gagaacaact gcctgctgca ccccatgagc cagcacggca tggaggacga ggaccgcgag 540
gtgctgcgct ggaagttcga cagcaccctg gcccgccgcc acatggcccc cgagctgcac 600
cccgagtact acaaggactg ctga                                     624

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<210> 136

<211> 27

<212> PRT

<213> Artificial Sequence

<220>

<223> WTnative (8_2_TV1_C.ZA)

<400> 136

Met Arg Val Met Gly Thr Gln Lys Asn Cys Gln Gln Trp Trp Ile Trp
1 5 10 15

Gly Ile Leu Gly Phe Trp Met Leu Met Ile Cys
20 25

<210> 137

<211> 81

<212> DNA

<213> Artificial Sequence

<220>

<223> WTnative (8_2_TV1_C.ZA)

<400> 137

atgagagtga tggggacaca gaagaattgt caacaatggt ggatatgggg catcttaggc 60

ttctggatgc taatgatttg t 81

<210> 138

<211> 27

<212> PRT

<213> Artificial Sequence

<220>

<223> WTmod(8_2_TV1_C.ZA)

<400> 138

Met Arg Val Met Gly Thr Gln Lys Asn Cys Gln Gln Trp Trp Ile Trp
1 5 10 15

Gly Ile Leu Gly Phe Trp Met Leu Met Ile Cys
20 25

<210> 139

<211> 81

<212> DNA

<213> Artificial Sequence

<220>

<223> WTmod(8_2_TV1_C.ZA)

<400> 139

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ttctggatgc tgatgatctg c 81

<210> 140
<211> 25
<212> PRT
<213> Artificial Sequence

<220>
<223> Tpa1

<400> 140

Met Asp Ala Met Lys Arg Gly Leu Cys Cys Val Leu Leu Leu Cys Gly
1 5 10 15

Ala Val Phe Val Ser Pro Ser Ala Ser
20 25

<210> 141
<211> 75
<212> DNA
<213> Artificial Sequence

<220>
<223> Tpa1

<400> 141
atggatgcaa tgaagagagg gctctgctgt gtgctgctgc tgtgtggagc agtcttcgtt 60
tcgcccagcg ccagc 75

<210> 142
<211> 23
<212> PRT
<213> Artificial Sequence

<220>
<223> Tpa2

<400> 142

Met Asp Ala Met Lys Arg Gly Leu Cys Cys Val Leu Leu Leu Cys Gly
1 5 10 15

Ala Val Phe Val Ser Pro Ser
20

<210> 143
<211> 69
<212> DNA
<213> Artificial Sequence

<220>

<223> Tpa2

<400> 143

atggatgcaa tgaagagagg gctctgctgt gtgctgctgc tgtgtggagc agtcttcggt 60

tcgcccagc 69